Testimony to the Finance Subcommittee on Energy

April 12, 2007

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Mr. Chairman, distinguished members of the subcommittee, I would like to sincerely thank you for the opportunity to testify before you today on alternative energy policy with a focus on strategies employed by the leading countries in the solar energy industry. Our CEO, Rusty Schmit apologizes for not being able to make it this afternoon as his plans changed due to pressing business matters; however his thoughts and comments are included in my written statement.

I am the Vice President of Business Development at Advent Solar, a solar cell manufacturing company located in Albuquerque, New Mexico that is commercializing an advanced solar cell technology developed under Department of Energy funding in the 1990's at Sandia National Laboratories. The company has been in operation for nearly four years and recently began high-volume production in its new 25MW manufacturing facility. Advent currently employs 165 people in manufacturing, engineering, R&D, finance, and sales and marketing, and we expect to grow rapidly as we expand production over the next few years.

Even though Advent Solar is a U.S.-based company utilizing U.S.-based technology, most of its sales are in Europe and virtually all of its manufacturing equipment was purchased from European vendors. Advent believes that the U.S. has the potential to be the largest and most prosperous solar market in the world, but for the immediate future, the company has found better opportunities working with customers in the Europe. In addition, most of Advent's formidable competition resides in Eastern Europe, Japan, and China, areas of the world where incumbent manufacturing firms benefit from significant economic incentives and monetary grants.

With a 6.8% market share of solar cell production in 2006, the United States is continuing to fall behind the leading solar energy producing and consuming countries of the world in terms of technology development and job creation when it comes to the utilization of renewable energy sources. The main reason for this comparative decline is that the United States has not provided adequate stimuli for market demand, R&D, and manufacturing incentives. At the same time that our country is lagging in providing policy incentives, the rest of the world, particularly the EU and Japan have been asserting their policy leadership and taken a commanding lead in alternative energy development.

Twenty-five years ago the United States was the clear leader in technology development for solar power generation as well as general manufacturing. The Department of Energy and other government agencies funded critical early work

to develop reliable products, and the results of that early work can still be seen today around the world.

Today, sadly, that is no longer the case. Only BP Solar is among the top ten producers in the world that is located in the United States. Today's leading companies are located in Japan, Europe, and increasingly China. This loss in technological leadership translates into job losses and missed opportunities to create hundreds of thousands of new jobs.

INTERNATIONAL EXPERIENCE

The alternative energy policies initiatives implemented in other countries have done three things to advance market leadership in these respective countries:

1. Advanced the technologies more rapidly than the U.S.
2. Accelerated market demand and reduced dependency on conventional energy sources.
3. Stimulated the building of indigenous manufacturing, thus creating high-wage jobs and related benefits.

I would like to present three examples of countries that have implemented policies that have had significant, identifiable benefits: Japan, Germany, and China.

Japan was the first country to have a meaningful, long-term market stimulus program as a result of robust R&D funding. A rebate program was implemented in the 1990's in order to stimulate demand. In this program the purchaser (typically a homeowner) received a rebate for a certain portion of the price of a solar installation. Although this rebate declined annually, the market demand stimulus was sufficient to create significant demand and fuel growth for what would become the largest manufacturing firms in the industry. In 2006, the rebated was phased out totally, but market demand in Japan continues to grow. This steady, long-term creation of demand enabled Japanese manufacturers to build strength in their market. It is not a coincidence that today there are four Japanese companies among the top ten manufacturers in the solar industry: Sharp, Mitsubishi, Kyocera, and Sanyo. As recently as fifteen years ago, none of these companies were in the top ranks. In 2006, Japan was the second largest solar energy consumer with 17% of the global market, but the country is the largest solar cell producer with a 36% market share.

Germany was motivated to drive more wide-spread use of solar power by several factors: the country needed additional electric generation, the public was not interested in adding nuclear power, and there was broad concern over climate change and other related environmental risks. Based on these criteria, the government decided to test several programs intended to drive market demand for solar power. After initially trying a rebate program similar to the Japanese,

the Germans settled on what is referred to as a “feed-in tariff” – a program under which the electric utilities buy solar-generated electricity at a higher rate than the rate payers pay for the power. For example, in 2006, solar-generated electricity was purchased at 49-52 Euro cents per kilowatt-hour (depending on system size), whereas the typical homeowner was only paying about 15-18 Euro cents per kilowatt-hour. This rate differential declines 5% per year, but the premium rate is guaranteed for a 20 year period. It is important to note that this program is not government-funded, but rather the additional costs are funded by all rate payers. Each pays a small additional amount on their monthly bill to fund the solar feed-in tariff.

This incentive program has made German the largest solar energy consuming country in the world with a 55% market share in 2006. The broad market penetration of solar has also enabled related and necessary infrastructure to develop. For example, banks now readily provide the financing for the purchase price of solar panels because the market flow from selling the power is well established and predictable. This helps overcomes the up-front cost barrier that had prevented many homeowners and businesses from installing a solar power system.

As was the case in Japan, the strong market demand in Germany has also driven incredible industrial development and employment. An estimated 100,000 jobs have been created in the renewable energy field over the past number of years in Germany. In 2006, over 35,000 jobs were reported in the solar sector alone. Germany trade associations predict a total of 200,000 jobs in the renewable energy sector over the next fifteen years.

This build-up of manufacturing of solar power components has been further accelerated by the government’s policy of aiding companies who create high-wage jobs in regions of Germany that need economic development. Generally, the German and E.U. governments will pay a company for about 25-45% of a total project investment in these challenged areas. One recent example is Conergy AG, a company based in Hamburg, Germany, which has embarked on a 250 million Euro factory in one of these German economic development zones. The combined investment grant of the various governments towards this project is 76 million Euros. While I cannot speak for Conergy, it is clear to see that this is a tremendous incentive to locate manufacturing facilities in those regions and not in areas that do not provide a comparable incentive.

The newest country to begin realizing the potential of the solar power industry to create jobs is China. Five years ago there was not a single Chinese company of any significance manufacturing solar power components. Today there are numerous Chinese companies publicly traded on U.S. stock exchanges and many more benefiting from public/private incentive programs. One of these companies, Suntech, became the fourth largest solar cell producer in the world in 2006. The reason for this recent growth has been the Chinese government’s

policies promoting manufacturing in the renewable energy sector. Many analysts predict that China will soon control over 50% of the solar manufacturing market. Presently, China exports 95% of its production and is not expected to be a significant consumer of solar products for a number of years.

Advent Solar

Now I would like to bring this back to the specific case of the company I work for, Advent Solar. We are a typical American company competing in a very rapidly growing global marketplace. Advent has a unique technology, developed with Department of Energy R&D funding and is in a strong position for growth. However, there are two significant barriers for us to continue to keep our growth and jobs in the United States.

First, there is insufficient demand in this country for our products. In 2007, nearly 90% of our sales will be in Europe. As our volume increases, the economics of shipping large quantities of products around the world becomes prohibitive, making overseas manufacturing attractive. In order to continue to manufacture here, we will need a robust and growing domestic market to support in the United States.

Second, we will need large amounts of capital to expand our manufacturing capacity to achieve an economic scale. It is increasingly difficult to attract this kind of capital when our overseas competitors can add the same capacity for two-thirds of the investment in lower cost markets. At some point, Advent will be forced to consider the benefits of expanding in lower cost countries in order to remain competitive. Outsourcing is a term that is often used these days to refer to the shifting of jobs to low labor cost countries, such as the movement of jobs in the Information Technology industry to India. In this industry, however, labor is not the major cost component - it is the cost of capital and that cost is lower in many other countries. Whether in Germany, driven by the need for economic development, or China, where the cost of capital is inherently low, it is very difficult to compete from a U.S. manufacturing base. It is not our intent or desire to invest overseas, but unfortunately, it may be a competitive reality.

Recommendations

Based on my company's experiences, I recommend the following actions by this subcommittee in order to begin to address the energy and environmental issues. I have only included recommendations that fall under the Finance Committee's jurisdiction. Obviously, many of the EU models to create demand are not tax-based incentives and are therefore not included even though I think they have significant merit. I would be happy to provide more information if you are interested.

- Expand the existing investment tax credit for the purchase of renewable alternative fuel power systems, such as solar along the lines of S.590 – a bill introduced by Senator Smith and Senator Salazar with broad support on this Committee. Like Japan and Germany before, this demand incentive will provide the stimulus to awaken the largest potential solar market in the world.

- Create some type of manufacturing investment tax credit to assist domestic manufacturers in technologies such as solar products and equipment. This new manufacturing tax credit should be available to U.S. based manufacturers who are located in the United States and pay U.S. income taxes. The demand created above described incentives should be satisfied by U.S.-based companies, and this investment tax credit would help make U.S. manufacturers competitive in a global industry.

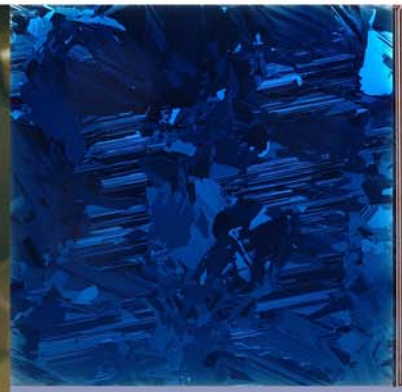
The program should have a graduated tax credit to encourage investments. For example:

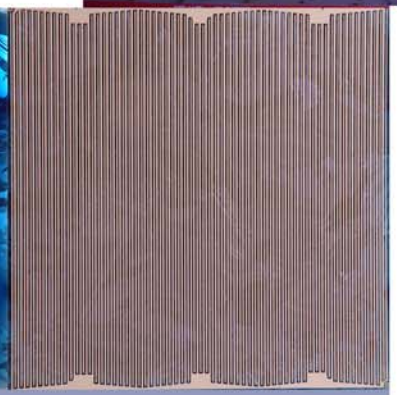
Qualified Manufacturing Investment	Investment Tax Credit
Less than $5,000,000	10%
$5,000,000 to $10,000,000	20%
$10,000,000 to $50,000,000	30%
Greater than $50,000,000	40%

Mr. Chairman, I look forward to working with you and your staff on these ideas and others you may have. Thank you.

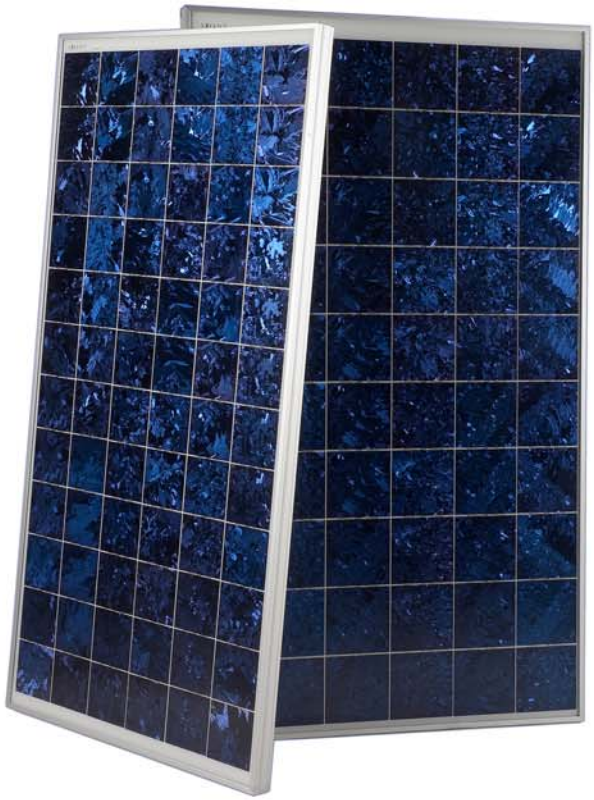
ADVENT®

SOLAR

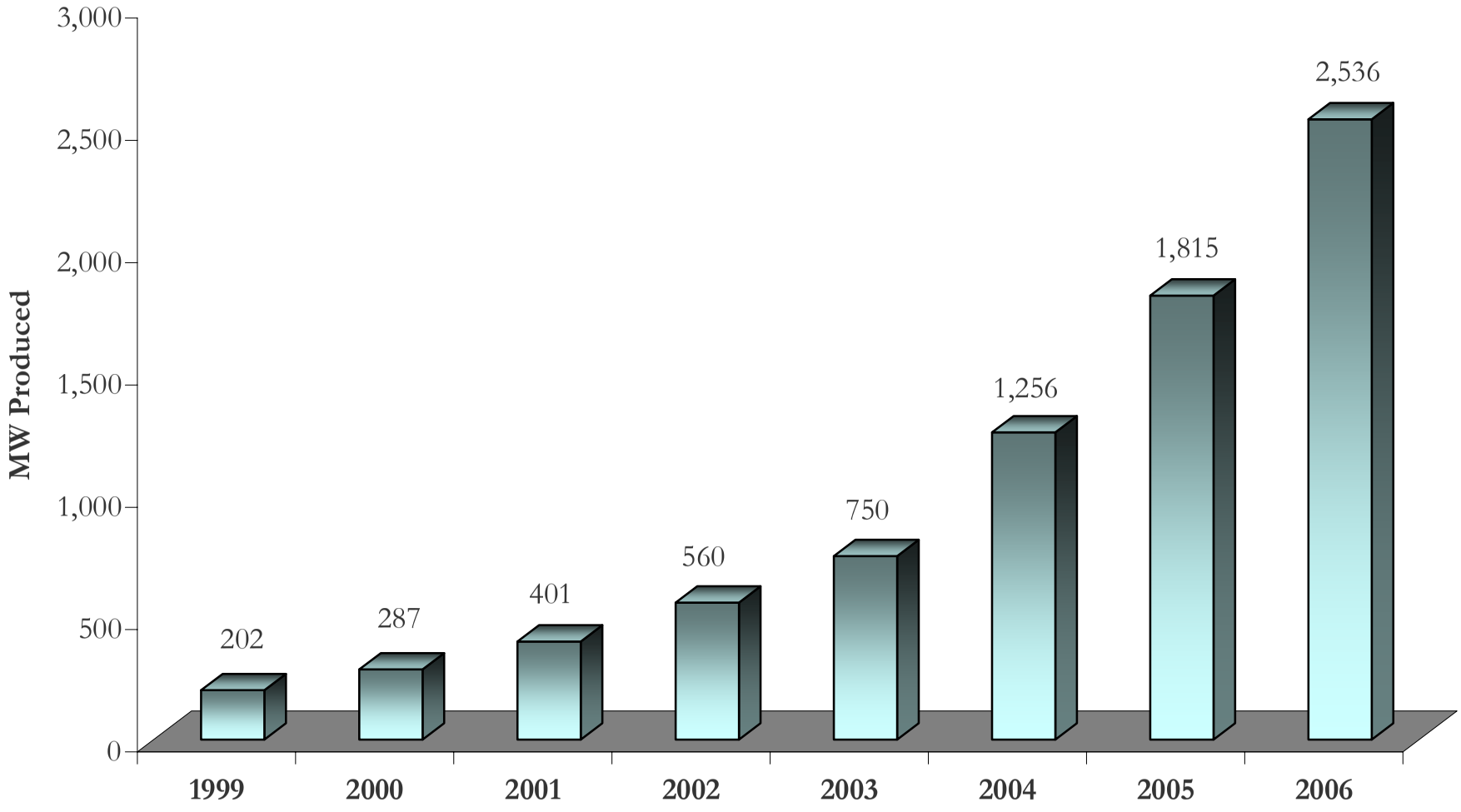




- Founded in 2002
- 165 Employees
- 25 MW Capacity
- Emitter Wrap Through Technology

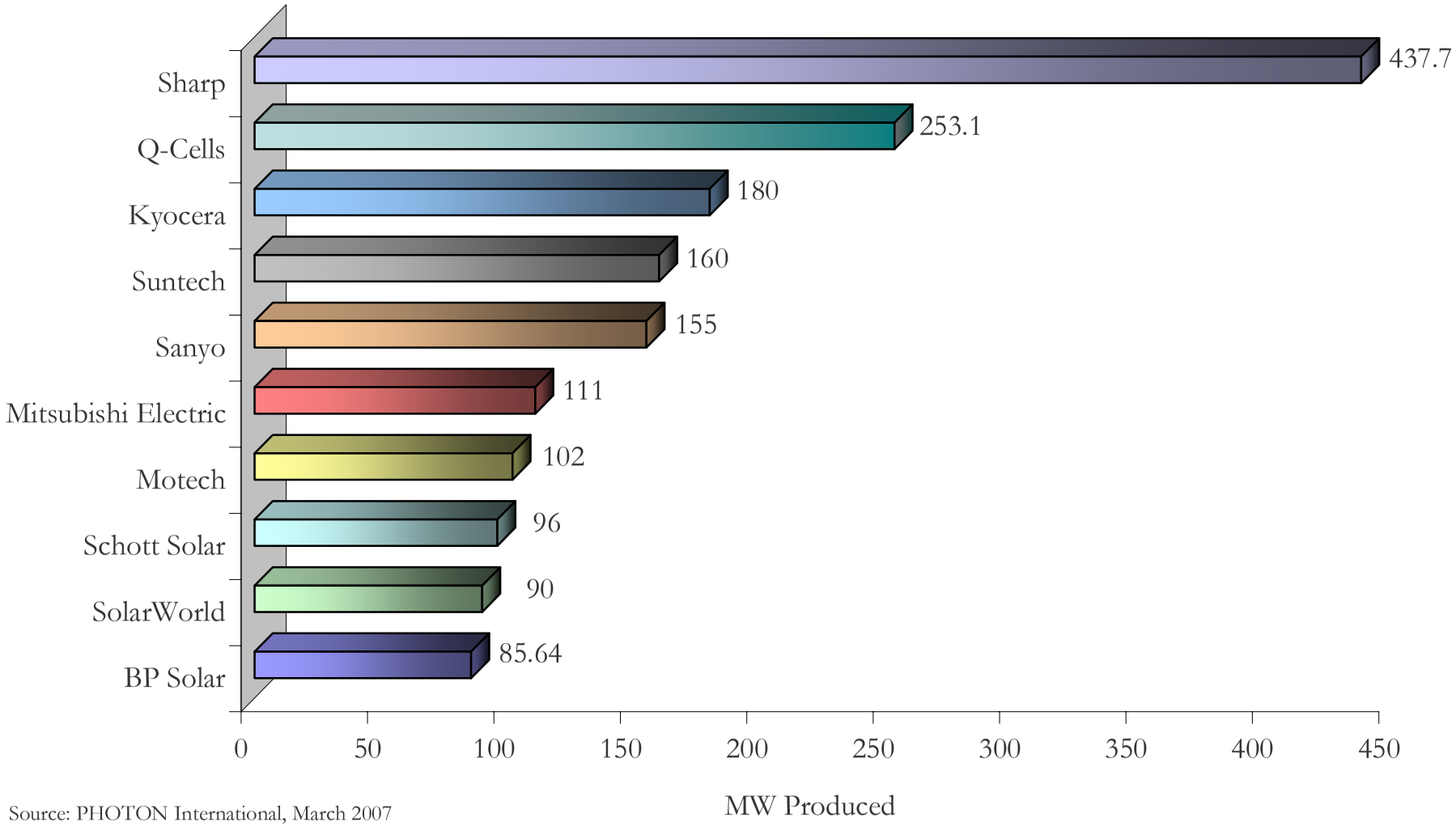


Solar Cell Production (1999 to 2006)



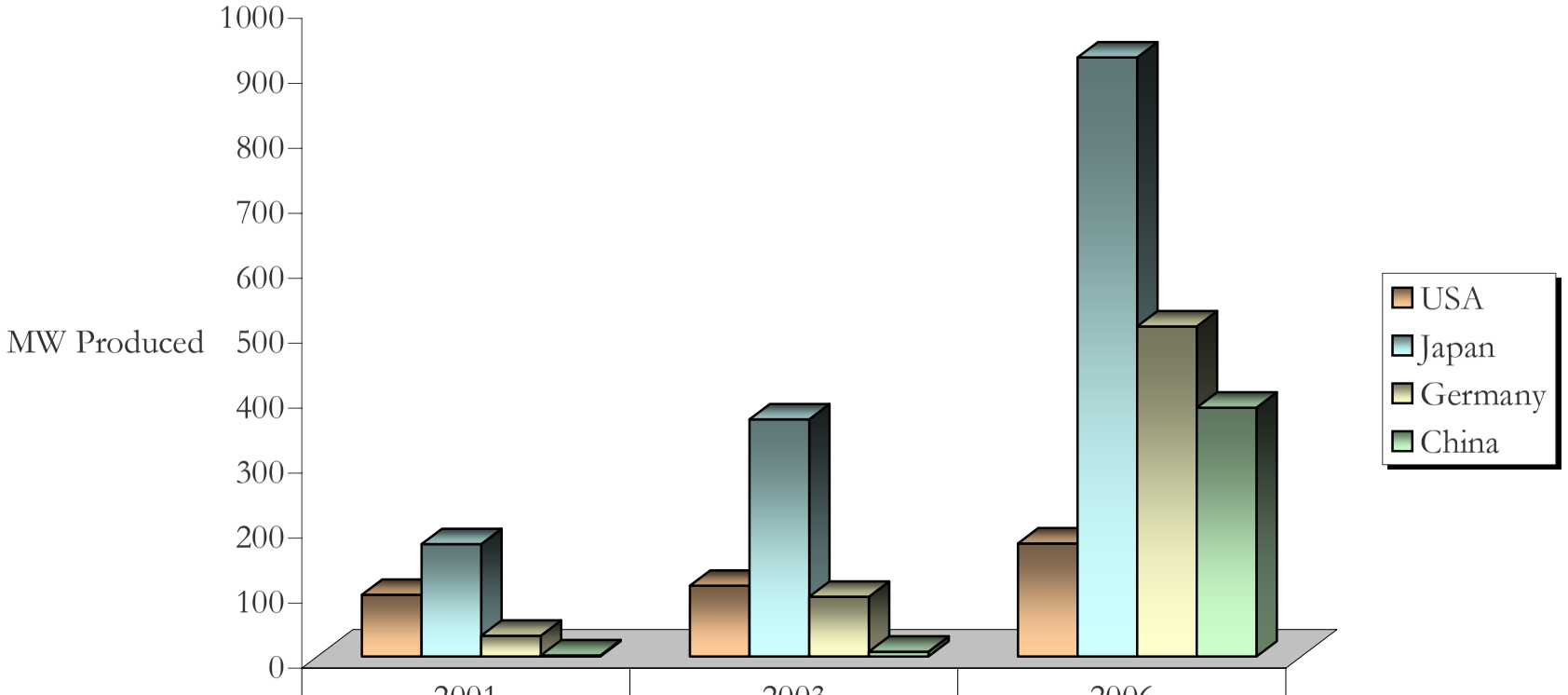
Source: PHOTON International, March 2007

Top 10 Global PV Cell Producers (2006)



Source: PHOTON International, March 2007

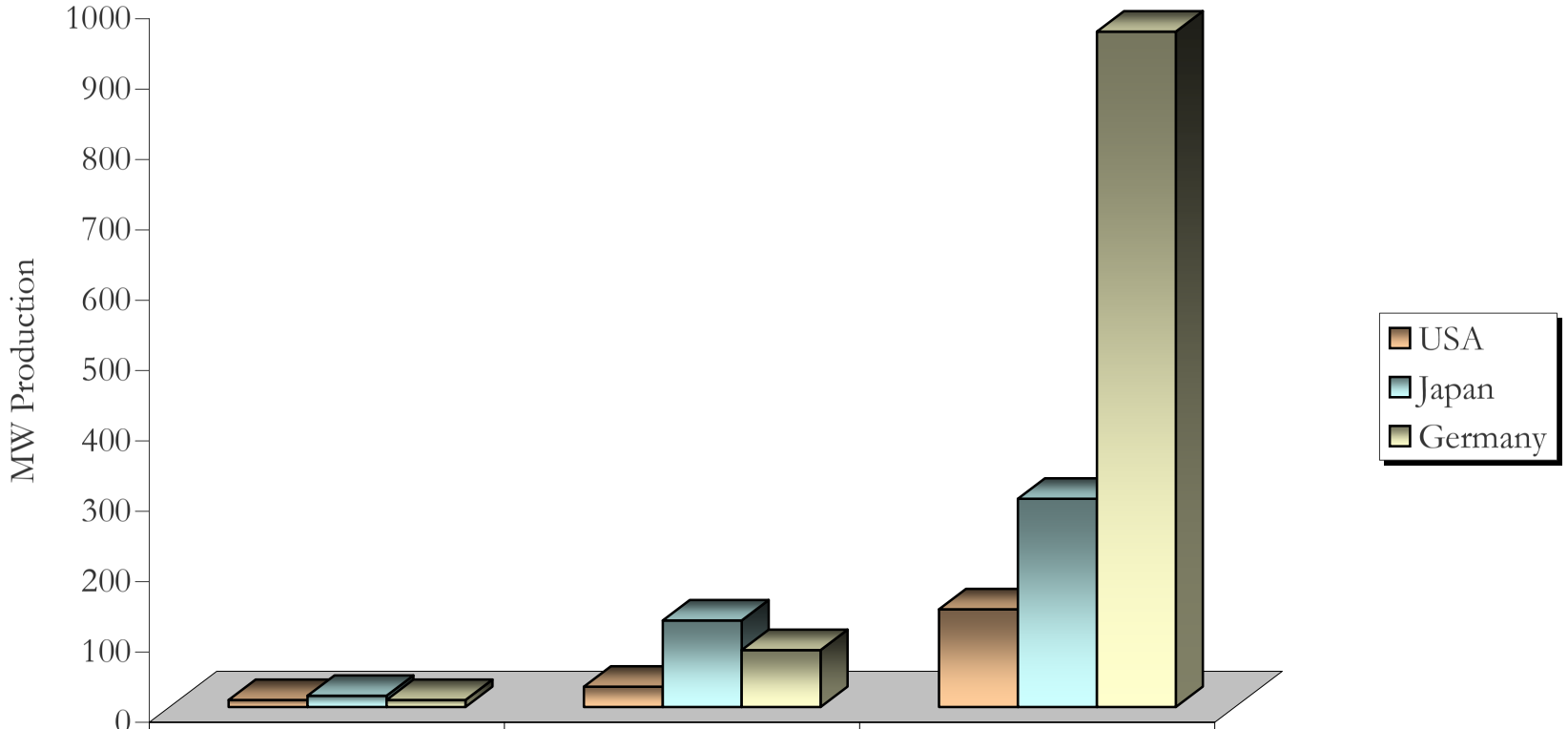
Photovoltaic Cell Production (2001-2006)



	2001	2003	2006
USA	95	109	174
Japan	173	365	922
Germany	32	92	508
China	1.7	7.5	383

Sources: PHOTON International, April 2002, March 2004, March 2007

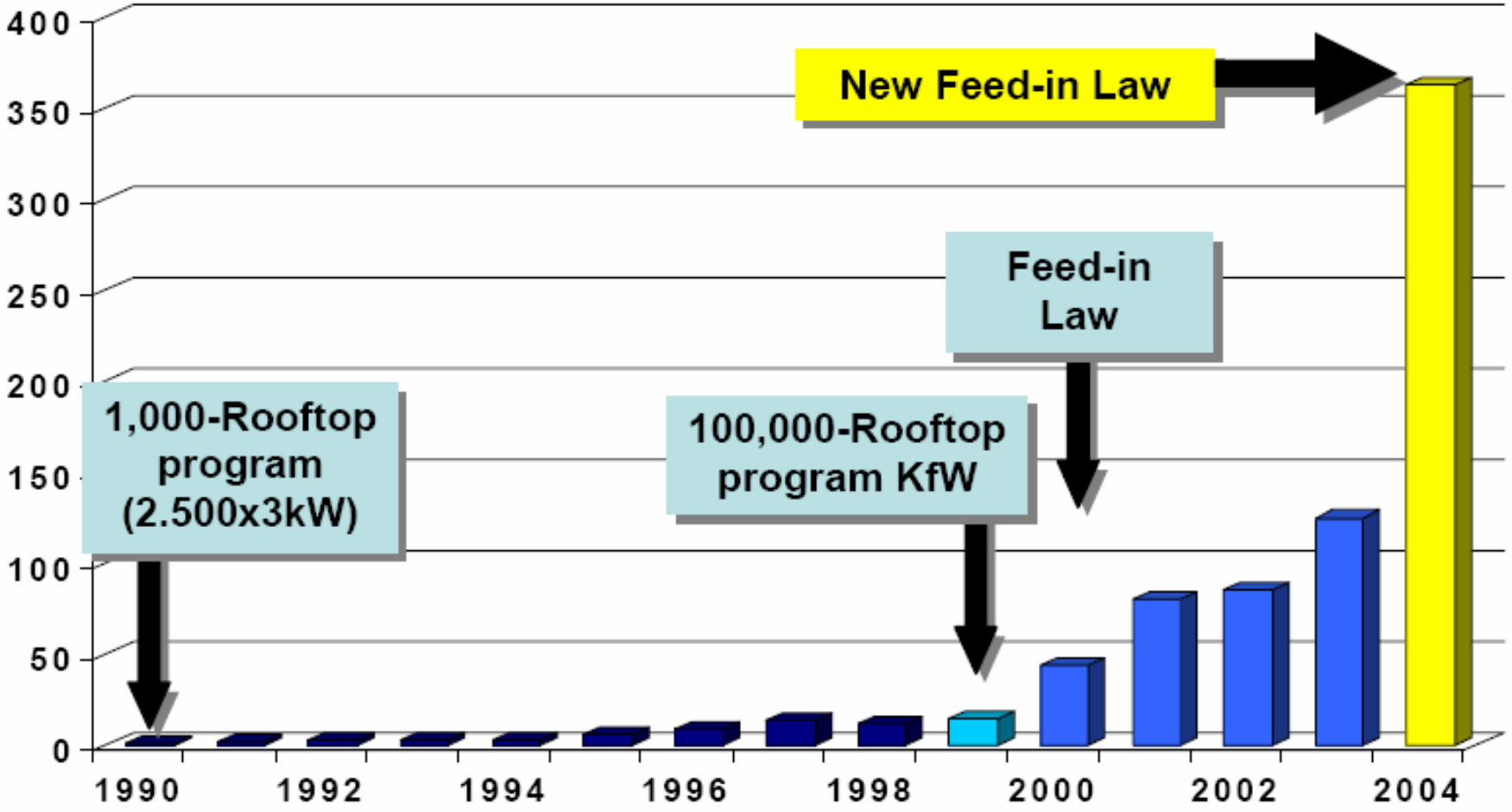
Photovoltaic Sales by country (1996-2006)



	1996	2001	2006
USA	10	29	139
Japan	16	123	296
Germany	10	81	960

Sources: http://www.iea-pvps.org,
http://www.solarbuzz.com/Marketbuzz2007-intro.htm

Influence of Feed-in Tariff on German PV Installation (EPIA)



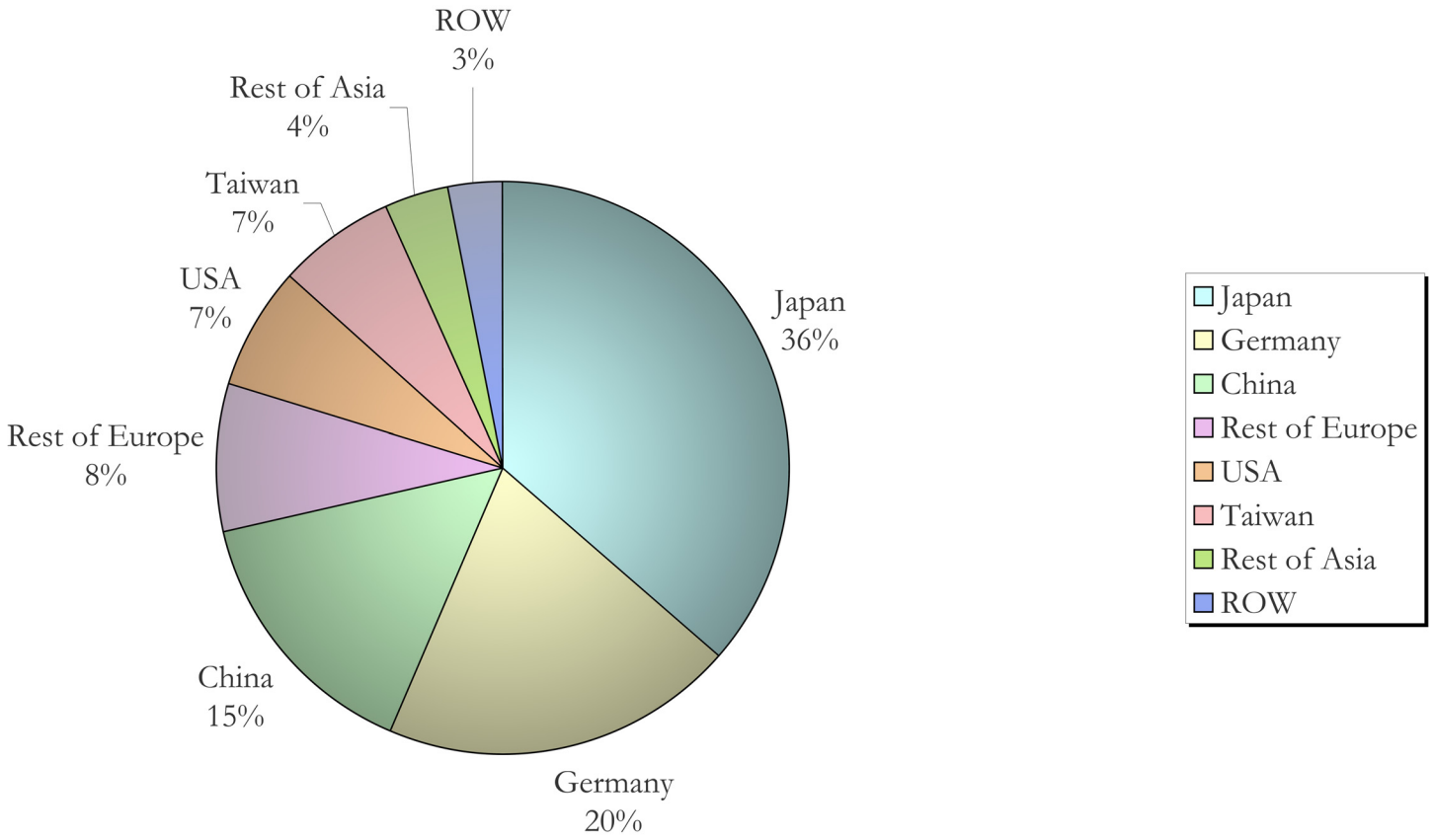
Source: EPIA

European Feed-in Tariff Programs

2006-2007	Tariff Euro cents/KWh	Term (years)	Program Cap	Comments
France [1]	22.5-30	20	Not yet fixed	Lower rate for residential, higher rate for industrial customers and overseas territories. 50% tax credit (residential)
Germany [2]	37.4-54	20	None	Varying rates for ground-mount, rooftop and façade installations. 5%d annual tariff decline (6.5% for ground mount)
Italy [3]	36-49	29	500 MW	5% annual tariff decline. Annual cap of 85 MW of installations.
Luxembourg [4]	28-56	N/A	3 MW	Private individuals can access the higher rate. Public bodies can access the lower rate
Portugal [5]	28-51	15	N/A	Payable to Independent Power Producers, widespread confusion about the scheme
Spain [6]	22-42	25	400 MW	Higher tariff payable for systems up to 100 kW
Greece [7]	40-45	20	700 MW	No special tariffs for ground mounted or BIPV systems.
Austria [8]	47-60	20	15 MW	Very low annual cap, ammendments to law are in process

Sources: 1. Energies Renouvelables Et Efficate Energetique, Solar Buzz 2. BSW- German Solar Industry Association 3. Photon International (March 2007), Renewable Energy World (July 2006) 4. Solar Buzz 5. Photon International (Jan. 2007) 6. Spanish Renewable Energy Association, Solar Buzz 7. Renewable Energy World (July 2007), HELAPCO (Hellenic Association of PV Companies) 8. HELAPCO (Hellenic Association of PV Companies)

Photovolatic Cell Production per region (2006)



Source: PHOTON International, March 2007