

SOLAR GENERATION 6

EXECUTIVE SUMMARY

October 2010



GREENPEACE

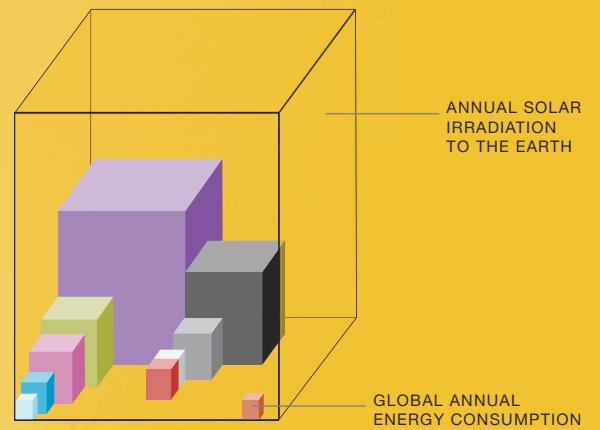


SOLAR GENERATION 6

EXECUTIVE SUMMARY

october 2010

FIGURE 1
SOLAR IRRADIATION
VERSUS ESTABLISHED
GLOBAL ENERGY
RESOURCES



- | | |
|----------------|-----------|
| ■ WIND | ■ COAL |
| ■ BIOMASS | ■ OIL |
| ■ GEOTHERMAL | ■ GAS |
| ■ OCEAN & WAVE | ■ URANIUM |
| ■ HYDRO | |

FOSSIL FUELS ARE EXPRESSED WITH REGARD TO THEIR TOTAL RESERVES WHILE RENEWABLE ENERGIES TO THEIR YEARLY POTENTIAL.

1. INTRODUCTION

The growing appetite for energy in the entire world, the implications of climate change, the increasing damages to our environment and the scarcity of fossil fuels have created the appropriate conditions for renewable energies development. For decades we have known that just a small percentage of the sun's energy reaching the earth's surface on a daily basis could power the entire mankind several times over. The time has come for solar photovoltaic (PV) electricity to be a part of the global solution to fight climate change and to help us shift to a carbon-free economy. It is also, in addition, a prosperous industry sector in its own right.

Unlimited power from the Sun

The solar irradiation received by the earth every year is by far larger than the sum of the complete fossil and fissile reserves.

There are virtually no constraints of material availability, no industry limitation, no environmental constraints to the deployment of solar PV electricity. Solar PV electricity has an excellent environmental footprint; in average, the energy necessary to produce a PV panel is approximately from two years to 6 months -depending of the location- of the electricity it will produce during its lifetime, which is of at least 20 or 25 years.

It can integrate seamlessly in highly dense urban environments, as well as desert areas. The quick ramp-up capabilities ensure the ability to follow the need for new energy demands.

The course for the solar age is being set today

Recognizing the significant benefits of PV technology, more than 50 national or regional governments worldwide have been adopting support mechanisms to accelerate the deployment of PV.

Over 1,000 companies are producing "crystalline silicon" technology products and more than 160 companies Thin Film technology ones. Other companies are working in the areas of concentrator PV while new technologies like organic PV are on the brink of their commercial development.

Once PV was a curiosity used for space exploration. Since then, a real market has seen the day. In 2009 in Europe, PV has reached the 3rd place following wind and gas in terms of annual new installed capacity and is expected to go even higher in 2010. With more than 30 GW of PV installed at the end of 2010, solar electricity is going mainstream.

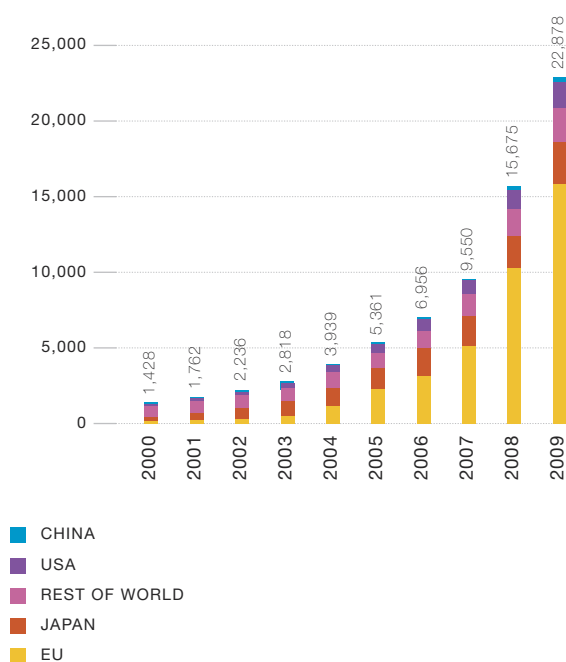
Prices are dropping fast

With PV prices dropping consistently by 22% each time the cumulated global production doubles, PV prices have dropped by 40% over the last two years and are expected to decrease up to 60% in 2020.

The average efficiencies of solar modules have also improved a couple of percentage points per year. It ranges currently at 15-19 % and with a target of 18-23% in 2010, the efficiencies in 2020 will drive prices even further down and concentrator PV systems will reach efficiencies above 30% in the coming years.

The time has come for solar electricity to be a part of the global solution to fight climate change.

FIGURE 2
EVOLUTION OF TOTAL INSTALLED CAPACITY FOR PV IN THE LAST DECADE
MW



source: Global Market Outlook for Photovoltaics until 2014, EPIA, May 2010.

2

REFERENCE FOR THE FUTURE

2. REFERENCE FOR THE FUTURE

This publication is the sixth edition of the reference global solar scenarios that have been established by the European Photovoltaic Industry Association (EPIA) and Greenpeace jointly for almost ten years. They provide well documented scenarios establishing the PV deployment potential world-wide by 2050.

The first edition of Solar Generation was published in 2001. Since then, each year, the actual global PV market has grown faster than the industry and Greenpeace had predicted (see table 1).

TABLE 1
ANNUAL PV INSTALLED CAPACITY
MW

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Market Result MW	334	439	594	1,052	1,320	1,467	2,392	6,090	7,203	
SG I 2001	331	408	518	659	838	1,060	1,340	1,700	2,150	2,810
SG II 2004					985	1,283	1,675	2,190	2,877	3,634
SG III 2006						1,883	2,540	3,420	4,630	5,550
SG IV 2007							2,179	3,129	4,339	5,650
SG V 2008								4,175	5,160	6,950
SG VI 2010										13,625



Concentrator
Photovoltaics installed
on trackers to follow
the sun.
© Concentrix

The solar PV market has outpaced
“Solar Generation” predictions by nine years.

3. SOLAR GENERATION 6 METHODOLOGY

The scenarios provide projections for installed capacity and energy output for the 40 coming years. In addition it evaluates the level of investment required, the number of jobs it would create and the crucial effect that an increased input from solar electricity will have on the lowering of global greenhouse gas emissions.

Taking into account the successful development of PV markets during last few years, the previously defined scenarios as “advanced” and “moderated” have been renamed respectfully as “paradigm shift” and “accelerated” ones.

The **Paradigm Shift Scenario** (previously “advanced”) estimates the full potential of PV. The assumption is that current support levels are strengthened, deepened and accompanied by a variety of instruments and administrative measures that will push the deployment of PV forward.

The **Accelerated Scenario** (previously “moderate”) is a continuation of current support policies and requires a lower level of political commitment than the “Paradigm Shift”. Its targets for 2030 could be achieved in 20 years without any major technology changes in the electricity grids.

The **Reference Scenario** is based on the reference scenario found in the International Energy Agency’s 2009 World Energy Outlook (WEO 2009) analysis, extrapolated to 2030. According to this, China and India are expected to grow faster than other regions, followed by the Other Developing Asia group of countries, Africa and the Transition Economies (mainly the former Soviet Union).



PV Pergola,
Forum Barcelona.
© Isofoton



Workers installing thin film
modules on a flat roof.
© First Solar

Assumptions

In order to assess the PV penetration in the three scenarios, the limitations that occur by the combination of different technologies are taken into account. This assumption also assumes little progress in storage systems in the short term.

Regional split	All three scenarios present a view of the future using global figures and calculate regional values for PV growth. The regions defined are the European Union (27 member states), non EU European states, OECD Pacific (including South Korea), OECD North America, Latin America, East Asia, Developing Asia (excluding South Korea), India, China, the Middle East, Africa and the Transition Economies (mainly the former Soviet Union).	
Two estimates for electricity consumption	<p>The global “IEA electricity demand Reference Scenario” simply takes the projections by the International Energy Agency (WEO 2009) into account. These show an increase in the global power demand.</p> <p>17,928 TWh/a in 2010 22,840 TWh/a in 2020 28,954 TWh/a in 2030 39,360 TWh/a in 2050</p>	<p>The global electricity demand from the Greenpeace/European Renewable Energy Council “Energy [R]evolution scenario” report (June 2010) takes extensive energy efficiency measures into account.</p> <p>17,338 TWh/a in 2010 19,440 TWh/a in 2020 20,164 TWh/a in 2030 31,795 TWh/a in 2050</p>
Carbon dioxide savings	Over the whole of the scenario period, it is assumed that PV installations will save on average 0.6 kg equivalent of CO ₂ per kWh, taking emissions from the PV lifecycle of between 12 and 25 g equivalent of CO ₂ per kWh into account.	
Employment	<p>30 full-time equivalent (FTE) jobs are created for each MW of solar power modules produced and installed.</p> <p>A figure for employment needs to take into account the whole PV value-chain including the research centres plus silicon, wafers, cells, modules and other components production and the complete installation. The figure does not include the jobs displaced from the conventional energy sector.</p> <p>A reasonable decrease is foreseen to reach around 20 FTE per installed MW in 2050.</p> <p>The maintenance jobs are expressed separately in the scenarios.</p>	
Capacity factor	<p>It expresses how much of the input ‘Sun’ energy is converted into electrical energy for PV.</p> <p>The estimated growth is between 12% and 17% by 2050 in both scenarios. This estimate takes all technologies and not only the most advanced ones into account. It assumes a reasonable penetration of more efficient technologies considering how fast technologies are actually evolving as well as the arrival of concentrated photovoltaic (CPV) in sunny regions.</p>	
Learning factor	In last 30 years, PV costs have dropped by more than 22% with each doubling of installed capacity. In all scenarios a pessimistic reduction is considered: 18% from 2020, 16% from 2030 and 14% from 2040 to 2050.	
Cost of PV systems	PV markets do not have the same level of maturity in all countries. The current prices in Germany, the most developed market, show that a sustainable market development can bring a steady decrease of prices. This outlook considers 2.5 EUR/Wp (Paradigm Shift) and takes the average of 2.8 EUR/Wp in 2010 for PV systems (Accelerated Scenario) which is already a reality.	

4. SOLAR GENERATION 6 HIGHLIGHTS

A future mainstream power source

By 2050, PV could generate enough solar electricity to satisfy 21% of the world electricity needs.

This represents a total of 2,260 TWh of solar PV electricity in 2030 and up to 6,750 TWh in 2050. This would come from an installed capacity of 1,845 GW in 2030 and 4,670 GW in 2050, to be compared with 23 GW installed in the world at the end of 2009.

FIGURE 3
AMOUNT OF SOLAR PV ELECTRICITY AS A PERCENTAGE OF WORLD POWER CONSUMPTION
%

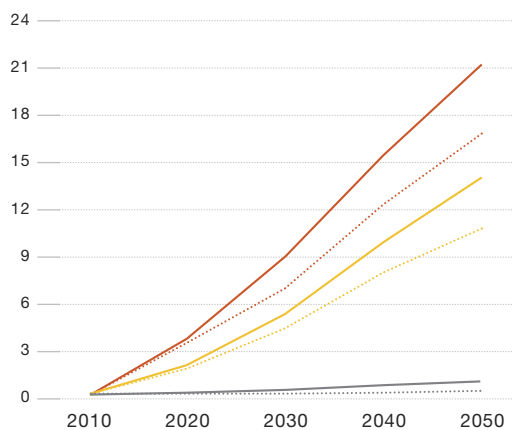


FIGURE 4
TOTAL OF WORLD PV INSTALLED CAPACITY UNDER THREE SCENARIOS
GW

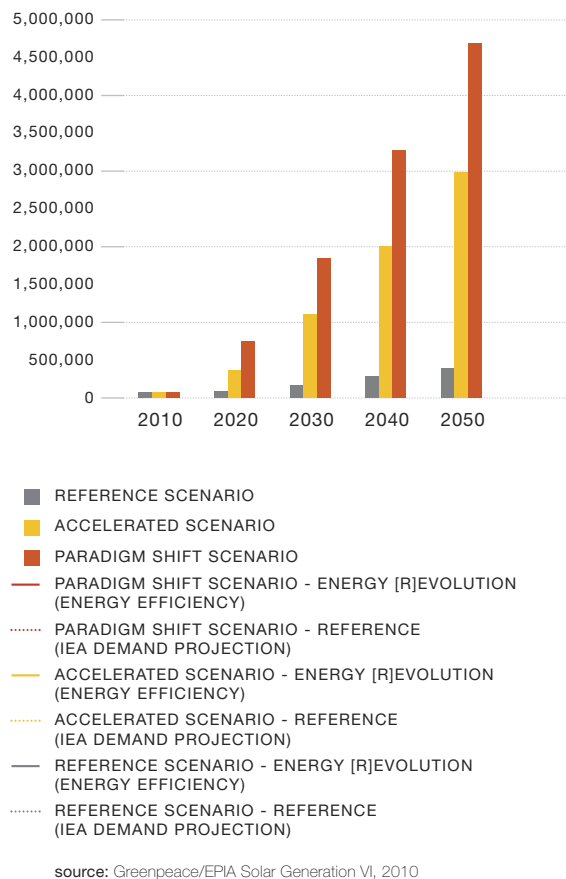


TABLE 2
AMOUNT OF SOLAR PV ELECTRICITY AS A PERCENTAGE OF WORLD POWER CONSUMPTION

Reference Solar market growth - IEA Projection	2010	2020	2030	2040	2050	
Solar power penetration of World's electricity in % - Reference (IEA Demand Projection)	%	0.2	0.4	0.7	1.1	1.4
Solar power penetration of World's electricity in % - Energy [R]evolution (Energy Efficiency)	%	0.2	0.4	0.8	1.3	1.8
Accelerated Solar Market growth						
Solar power penetration of World's electricity in % - Reference (IEA Demand Projection)	%	0.2	1.9	4.9	8.2	11.3
Solar power penetration of World's electricity in % - Energy [R]evolution (Energy Efficiency)	%	0.2	2.0	5.7	10.1	14.0
Paradigm Shift Solar Market Growth						
Solar power penetration of World's electricity in % - Reference (IEA Demand Projection)	%	0.2	4.0	7.8	12.6	17.1
Solar power penetration of World's electricity in % - Energy [R]evolution (Energy Efficiency)	%	0.2	4.2	9.1	15.5	21.2

source: Greenpeace/EPIA Solar Generation VI, 2010

An affordable and competitive source of energy

The EPIA/Greenpeace Paradigm Shift Scenario shows that by the year 2030, PV could generate up to 2260 TWh of electricity around the world and up to 6750 TWh in 2050. This means that enough solar electricity would be produced to cover 21% of the world electricity needs by 2050.

PV installed capacity could reach 1845 GW in 2030 and 4670 GW in 2050 in that scenario.

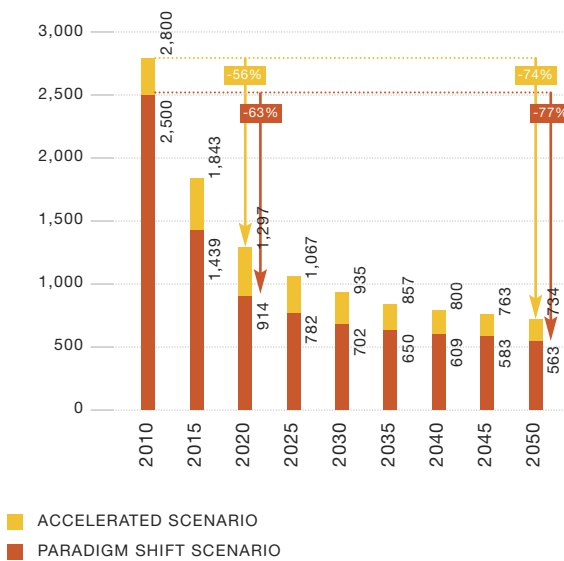
With this price decrease, the cost of generating electricity from PV is going down fast. Therefore it can quickly enter competition with conventional electricity sources.

Levelised Cost of Electricity (LCOE)

The generation costs of solar PV are expected to decrease significantly by 2020 and beyond. The figure 5 shows the generation costs of PV electricity in 2020 and 2030. The Levelised Cost of Electricity is a way to compare various power generation sources such as a conventional coal power plant and a PV system. LCOE allocates the costs of an energy plant across its useful life, to give an effective price per each unit of energy (kWh).

The LCOE depends on the market evolution (low and high cases) and the location of the PV system: the higher the irradiation (measured in hours of Sun irradiation), the lower the LCOE.

FIGURE 5
PRICE OF LARGE PV SYSTEMS EVOLUTION
EUR/KWp



source: EPIA

FIGURE 6
PV LEVELISED COST OF ELECTRICITY RANGES
EUR/kWh

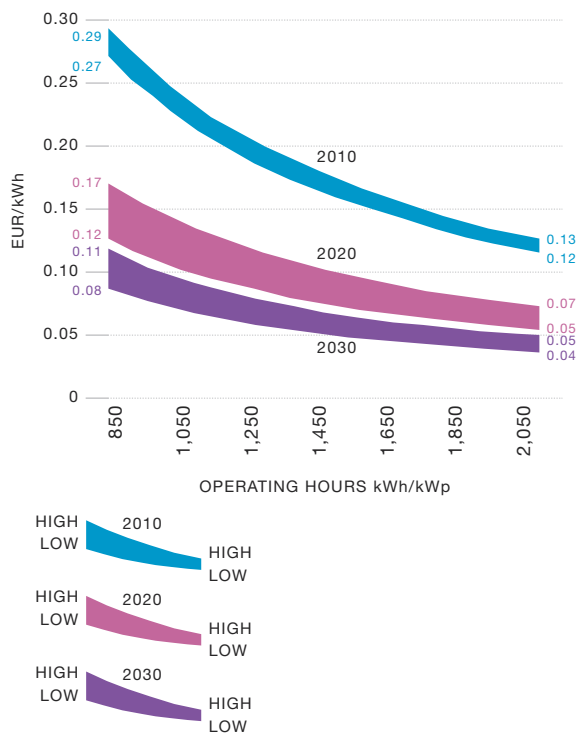
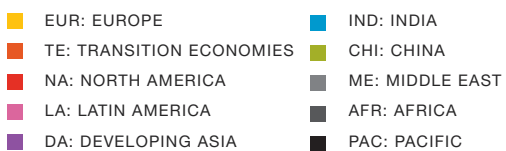
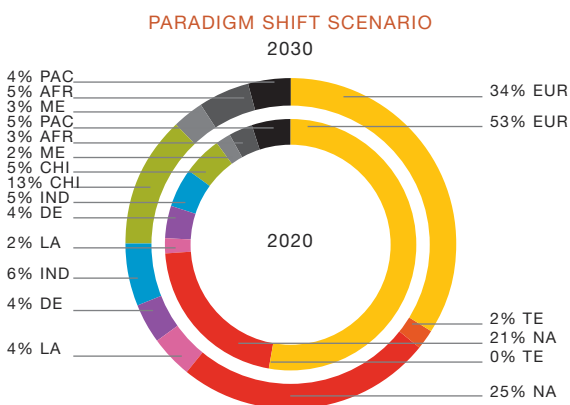
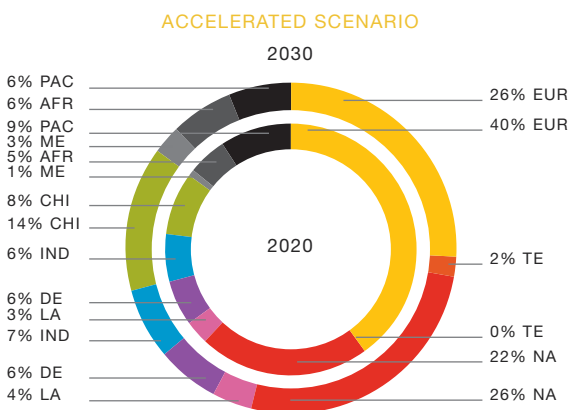
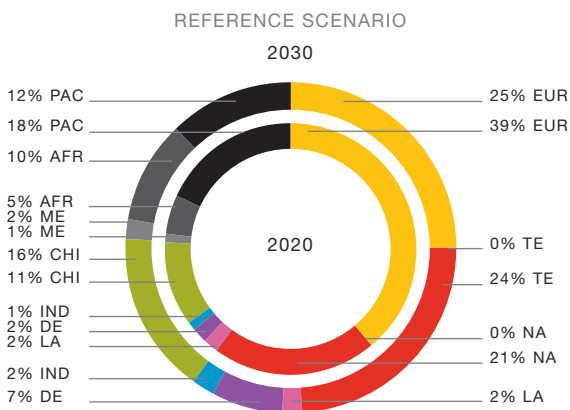


FIGURE 7
REGIONAL DEVELOPMENT
LINKED TO PV EXPANSION
UNDER THREE SCENARIOS
GW



source: Greenpeace/EPIA Solar Generation VI, 2010

5. WORLD PV DEPLOYMENT

The solar market has initially grown in developed countries; however it is expected to shift to developing countries in the coming decades. After 2020, North America, China and India will drive the PV market. After 2030, Africa, the Middle East and Latin America will also provide very significant contributions. Grid connected systems will continue to dominate the market in developed countries. In developing countries PV will be integrated into the electricity network in towns and cities, while off-grid and mini-grid installations are expected to play an increasing role in Asian and African countries to power remote villages.

Solar electricity is an efficient way to get power to people in developing countries, especially in regions with lots of Sun. While a standard household of 2.5 people in developed countries uses around 3,500 kWh annually, a 100 WP system (generating around 200 kWh in a country from the "Sunbelt") in developing countries can cover basic electricity needs for 3 people per household. In Europe, the generation of 500 TWh of electricity would mean delivering electricity to 357 million of Europeans at home. In the non-industrialised world, each 100 GW of PV installed for rural electrification can generate electricity for 1 billion people.



Large PV system at Munich airport.
© BP Solar

TABLE 3
PV INSTALLED CAPACITY EVOLUTION BY REGION UNTIL 2030
 GW

Reference Scenario	OECD Europe	Transition Economies	OECD North America	Latin America	Developing Asia	India	China	Middle East	Africa	OECD Pacific	Total
2020	30	0	16	1	2	1	8	1	4	13	77
2030	38	0	37	3	11	4	25	4	15	19	156
Accelerated Scenario											
2020	140	1	77	9	19	20	29	3	16	31	345
2030	280	20	285	47	70	71	150	30	62	64	1,081
Paradigm Shift Scenario											
2020	366	3	145	15	24	33	38	11	21	33	688
2030	631	42	460	66	83	113	242	47	85	77	1,845

source: Greenpeace/EPIA Solar Generation VI, 2010



Building integrated photovoltaics: a thin film panel in a façade-integration.
 © Goldbeck solar GmbH/Sulfurcell



PV manufacturing process. © Oerlikon

6. SOLAR PV ELECTRICITY BENEFITS TO THE WHOLE SOCIETY

Solar energy generates economic growth and employment

PV could generate up to 3.7 million jobs in the world by 2020 and more than 5 million by 2050.

The PV market in 2010 will reach a turn-over of more than 34 billion EUR (48 billion USD) in the world; the total of yearly investments could reach 160 billion EUR (225 billion USD) until 2040.

TABLE 4
INVESTMENT AND EMPLOYMENT POTENTIAL OF SOLAR PV

Reference Scenario	2008	2009	2010	2015	2020	2030	2040	2050
Annual Installation MW	4,940	7,262	7,550	4,117	5,920	18,740	19,928	20,129
Cost €/kW	3,000	2,900	2,800	2,351	2,080	1,703	1,487	1,382
Investment € billion/year	15	21	14	12	13	27	30	28
Employment Job/year	156,965	228,149	237,093	136,329	187,464	508,944	476,114	692,655
Accelerated Scenario								
Annual Installation MW	4,940	7,262	12,091	27,091	59,031	96,171	162,316	174,796
Cost €/kW	3,000	2,900	2,800	1,855	1,340	966	826	758
Investment € billion/year	15	21	34	50	79	93	134	133
Employment Job/year	156,965	228,149	374,319	810,228	1,690,603	2,629,968	4,027,349	4,315,343
Paradigm Shift Scenario								
Annual Installation MW	4,940	7,262	13,625	47,000	135,376	136,833	250,000	250,000
Cost €/kW	3,000	2,900	2,500	1,499	951	744	645	596
Investment € billion/year	15	21	34	70	129	100	161	149
Employment Job/year	156,965	228,149	417,010	1,372,185	3,781,553	3,546,820	5,563,681	5,346,320

source: Greenpeace/EPIA Solar Generation VI, 2010

Fighting climate change

The damage we are doing to the climate by using fossil fuels (oil, coal and gas) for energy and transport is likely to destroy the livelihoods of millions of people, especially in the developing world. It will also disrupt ecosystems and significantly speed up the extinction of species over the coming decades.

International climate negotiations have entered a difficult stage following the Copenhagen Climate Conference (COP 15) which failed to deliver the legally binding international treaty. The treaty would be crucial in providing investment security and a clear direction for the green transformation of the world economy. The Copenhagen Accord, a non-binding letter of political intentions, contains a number of provisions on mid-term targets for developed countries as well as mitigation actions by developing countries. Furthermore, it contains provisions for financial and technological support for developing countries carrying out actions to combat climate change.

However, the international community is still in search of an internationally accepted formula on how these provisions are to be carried out.

We are working against the clock since the Kyoto Protocol's first commitment period is about to expire in 2012. The "star" of the UNFCCC commits the developed countries that have ratified it (its 165 signatory countries) to reduce their greenhouse emissions by 5.2% compared to those levels of 1990. Expectations and hopes to pave the way for an international binding agreement on climate change now rest on Cancun (COP 16) and COP 17. The aim is to achieve a balanced package of measures and decisions based on a long-term shared vision, adaptation, mitigation, technology transfer and financing.

EPIA and Greenpeace believe that it is possible to reach a binding deal before the expiration of the end of the first commitment period of the Kyoto Protocol. Such an agreement will need to ensure that industrialised countries reduce their emissions on average by at least 40% by 2020, compared to their 1990 levels. They will need to provide a further 140 billion USD a year in order to enable developing countries to adapt to climate change, protect their forests and achieve their part of the energy revolution. On the other hand, developing countries need to reduce their greenhouse gas emissions by 15%-30% with regards to their projected growth by 2020 and raise their mitigation ambitions through the Nationally Appropriate Mitigation Actions (NAMAs). NAMAs is a vehicle for the emission reduction actions in developing countries as foreseen in the Bali Action Plan. Thereby a joint commitment from developed and developing economies is needed to limit the growth of greenhouse gas emissions. This is to be done by complying with legally binding emissions reduction obligations and adopting the necessary measures to reduce the use of highly polluting technologies whilst replacing fossil fuel dependency with renewable energy sources.

Solar PV electricity reduces CO₂ emissions

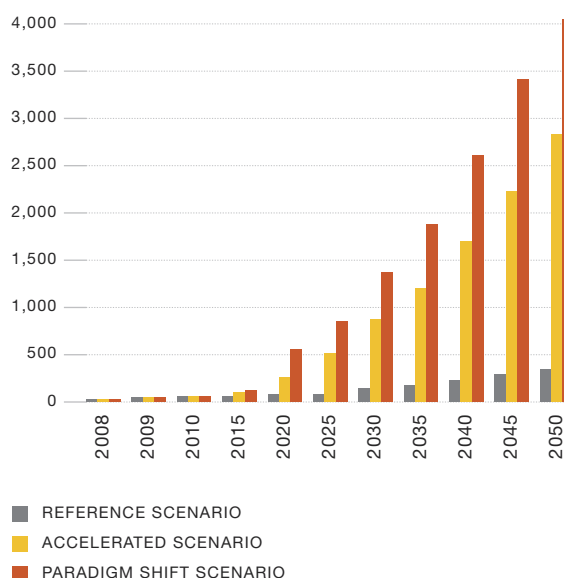
It is undeniable that PV can be an efficient tool to replacing conventional power generation and to fight climate change.

Generating 1 kWh of electricity from fossil fuels emits on average about 600 grams of CO₂-equivalent (including other greenhouse gases). On average, it can be considered that each kWh produced by PV spares 600 grams of CO₂-equivalent, even taking the energy used to produce PV panels into account.

Under the Paradigm Shift Scenario for PV growth up to 542 million of tonnes of CO₂ emission could be avoided each year from 2020 and up to 4 billion tonnes of CO₂-equivalent yearly by 2050 by shifting just 20% of power generation to PV. The cumulative total between 2010 and 2050 would represent up to 65 billion tonnes of CO₂ that will not be sent into the earth's atmosphere.

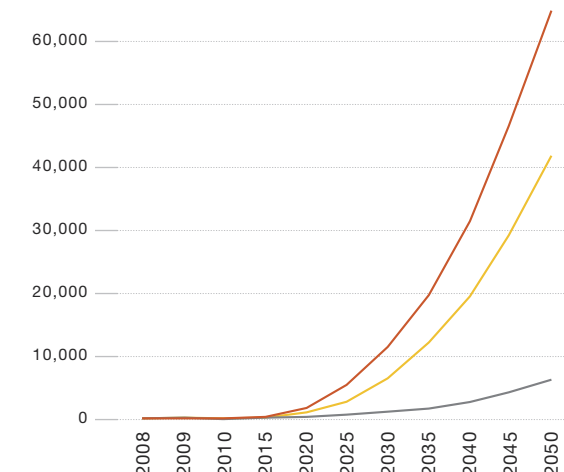
If there is sufficient political will, we believe that it is feasible to reach an ambitious set of decisions in Cancun at the end of 2010. Even if political will is currently lacking, major elements could still be in place, especially those related to long term financing commitments, forest protection and an overall target for emission reductions. However, we must do all we can to keep the process moving forward, to be able to celebrate at the Environment and Development Summit in Brazil in 2012 an agreement that will keep the world's temperature well below 2 degrees warming.

FIGURE 8
ANNUAL CO₂ REDUCTION
MILLION TONNES CO₂



Sources figures 8/9: Greenpeace/EPIA Solar Generation VI, 2010

FIGURE 9
CUMULATIVE CO₂ REDUCTION
MILLION TONNES CO₂



7. RECOMMENDATIONS

The Feed-in Tariff: the main driver of solar success

Feed-in Tariffs (FITs) are widely recognised as the most effective way to develop new markets for PV. World-wide, people are surprised that Germany, not a particularly sunny place, has developed such a dynamic solar electricity market and a flourishing PV industry.

The concept is that solar electricity producers:

- have the right to feed solar electricity into the public grid
- receive a reasonable premium tariff per generated kWh reflecting the benefits of solar electricity to compensate for the current extra costs of PV electricity
- receive the premium tariff over a fixed period of time.

Although simple, these three aspects can take significant efforts to be established. For many years power utilities did not allow solar electricity to “feed into” their grid and this is still the case in many countries today.

Additional mechanisms to support Feed-in Tariffs

- A fast, simple, linear, transparent and straightforward administrative process is required. It must be cost effective and proportional to the project size.
- In addition the connection of PV systems to the grid must be simple, transparent and non-discriminatory. Free market access and limited number of intermediaries must be ensured while mechanisms against speculation will allow a fair competition with conventional generation technologies.

Key attributes to a successful feed-in scheme:

A temporary measure – they are only required in the pre-competitive phase and are transitional.

Paid for by utilities, with costs distributed to all consumers – this protects the tariff from frequently changing government budgets and limits consumer cost increases.

Regular decrease of the tariff, depending of the market development, for newly installed systems – to put constant pressure on the PV industry to reduce costs each year.

Used to encourage high-quality systems – tariffs reward people for generating solar electricity, not just for installing it, this way owners keep the output high over the system's life.

Structured to encourage easier financing – as it guarantees revenue over a fixed period.

Access to energy in developing countries: the FTSM proposal

Investment and generation, especially in developing countries, will be higher than for existing coal or gas-fired power stations in the next five to ten years. The Feed-in Tariff Support Mechanism (FTSM) is a concept conceived by Greenpeace to bridge this gap, with the financial support from developed countries.

The aim of the FTSM is to help introduce feed-in laws in developing countries for their bankable, long-term and stable support for a local renewable energy market. For countries with a lot of potential renewable capacity, it would be possible to create a new 'no-lose' mechanism that generates emission reduction credits for sale to developed countries under the Kyoto Protocol. The proceeds would then be used to offset part of the additional cost of the Feed-in Tariff system. Other countries would need a more directly-funded approach to pay for the additional costs to consumers that a tariff would bring. The feed-in scheme would work exactly as in developed countries; only the financing of the scheme would differ.

For this, Greenpeace proposes a fund, created from the sale of 'carbon credits' and taxes. The key parameters for the FTSM fund would be the following:

- The fund guarantees payment of the Feed-in Tariffs over a period of 20 years, provided the project is operated properly.
- The fund receives annual income from emissions trading or from direct funding.
- The fund pays Feed-in Tariffs annually only on the basis of generated electricity.
- Every FTSM project must have a professional maintenance company to ensure high availability.
- The grid operator must do its own monitoring and send generation data to the FTSM fund. Data from the project managers and grid operators will be compared regularly to check consistency.

Micro credits schemes for small hydro projects in Bangladesh and wind farms in Denmark and Germany are good examples to see how small, community-based projects can be successful thanks to a large public support.

Solar helps provide access to energy

According to the IEA's report on the world's access to energy¹, in 2008 approximately 1.5 billion people, or 22% of the world's population, 85% of them is rural areas, did not have access to electricity. Energy alone is not sufficient to alleviate poverty. However, it is an important step in any development process. Access to electricity, for significant amounts of people brings the reaching of a number of Millennium Development Goals (MDG) set by the United Nations, into perspective.

There are three approaches in bringing electricity to remote areas:

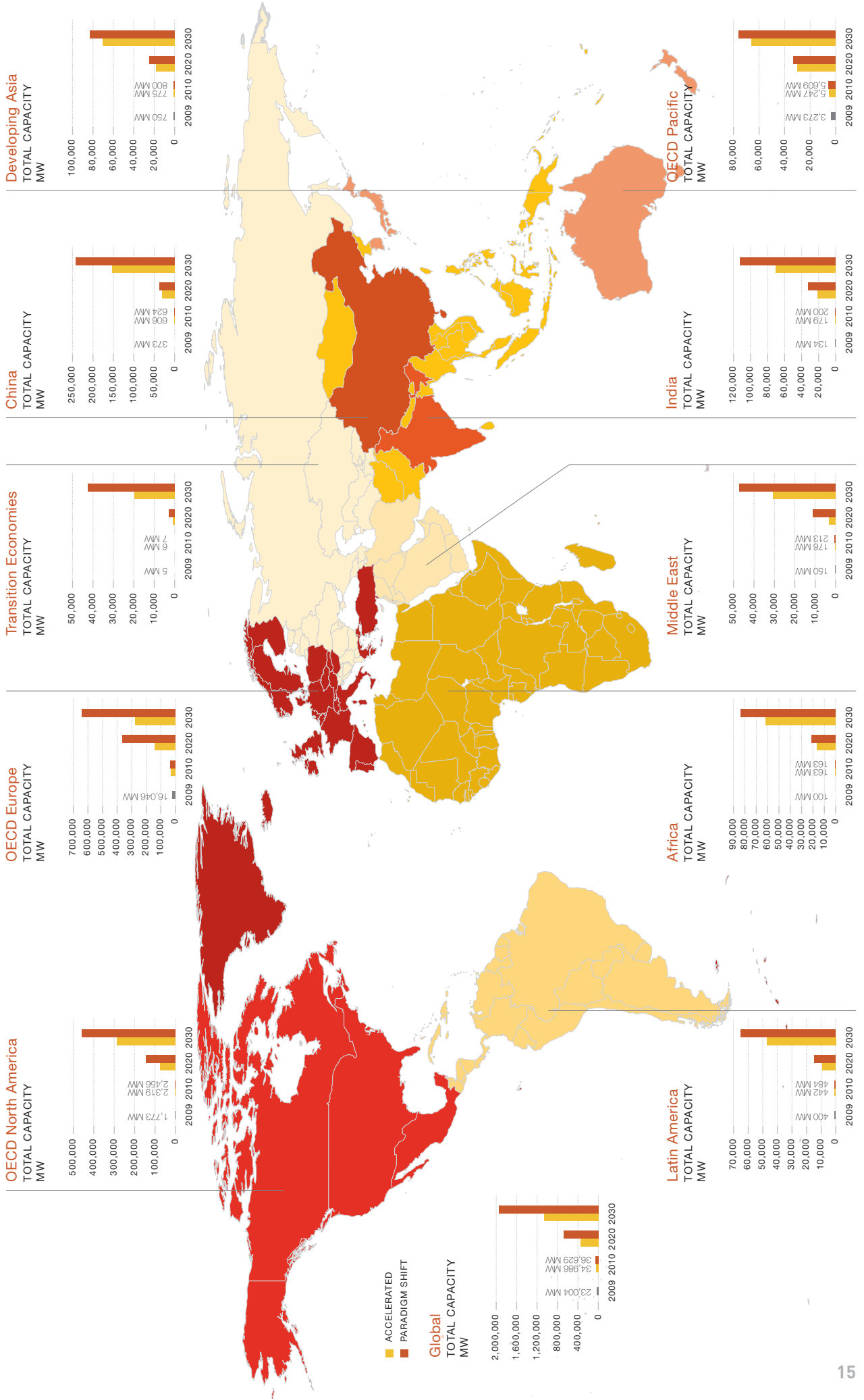
- **Extending the national grid.** This is often a difficult choice due to its high cost.
- **Providing off-grid technologies.** Many PV solutions exist (Pico PV system, classical solar home or residential systems), which are already cost competitive and are well-suited for household uses.
- **Developing mini-grids with hybrid power.** By combining renewable or non renewable-generation technologies, separate from the grid and backed-up with a local storage or generator PV plays a tremendous role in rural electrification.



Solar helps provide access to energy.
© BP Solar

¹ www.worldenergyoutlook.org/database_electricity/electricity_access_database.htm

WORLD MAP Global cumulative capacity showing the Accelerated and Paradigm Shift scenarios by region



SOLAR GENERATION 6

FULL REPORT

2010

Out soon

The full Solar Generation report will be published by the end of 2010.

It will be available here for download:

www.epia.org/solargeneration

EPIA

With over 220 Members drawn from across the entire solar photovoltaic sector, the European Photovoltaic Industry Association is the world's largest photovoltaic industry association. EPIA Members are present throughout the whole value-chain: from silicon, cells and module production to systems development and PV electricity generation as well as marketing and sales. EPIA's mission is to deliver a distinct and valuable service driven from the strength of a single photovoltaic voice.

Greenpeace

Greenpeace is a global organisation that uses non-violent direct action to tackle the most crucial threats to our planet's biodiversity and environment. Greenpeace is a non-profit organisation, present in 40 countries across Europe, the Americas, Asia and the Pacific. It speaks for 2.8 million supporters worldwide and inspires many millions more to take action every day. To maintain its independence, Greenpeace does not accept donations from governments or corporations but relies on contributions from individual supporters and foundation grants.

Greenpeace has been campaigning against environmental degradation since 1971 when a small boat of volunteers and journalists sailed into Amchitka, an area north of Alaska, where the US Government was conducting underground nuclear tests. This tradition of 'bearing witness' in a non-violent manner continues today and ships are an important part of all its campaign work.

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