Feed-in Tariffs
Blessing or Curse for Geothermal Energy?
Worldwide Background and Overview

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ABSTRACT

Feed –in tariffs (FiT) are an important and successful steering instrument to facilitate the use of renewable energies. In many countries of the world feed-in tariffs play a fundamental part to rise the commercial interest of investors concerning geothermal electricity production. In 20 EU-countries, in USA, east africa, central america, overall more than 30 countries FitS for all kinds of renewable energy support the energy change. About 15 countries created a feed-in tariff for geothermal electricity. In Germany with its difficult geological situation feed-in tariff for geothermal electricity rose in 2012 to 25€Ct/kWh (30$Ct/kWh). Other FiT i.e. for photovoltaic are reduced by the government as they succeeded .

Introduction

Feed-in tariffs are simply payments per kilowatt-hour for electricity generated by a renewable resource. They are the world's most successful policy for the rapid development of significant amounts of renewable energy.

Feed-in tariffs are used in Germany, France, and Spain and have driven these countries to world leadership in renewable energy development. In so doing, feed-in tariffs have created hundreds of thousands of new jobs in Europe. But they are easily adaptable to all countries. There are no intrinsic limits on using them at either state, provincial, or federal level.

Feed-in tariffs work because they are more equitable than other policies. They enable everyone--including homeowners, farmers, cooperatives, and businesses large and small--to profit from renewable energy. They comprise a system of payments for each kilowatt-hour of electricity generated. The price that is paid is based on the cost of the electricity produced plus a reasonable profit for the producer. Feed-in tariffs can be implemented alongside existing renewable energy programs, such as net metering and renewable energy standards.

Feed-in Tariffs

- Allow renewable energy generators to interconnect with the grid, and
- Specifies the amount that they are paid for their electricity,
- And specifies how long they will be paid.

Origin of Feed-In Tariffs

The feed in tariff is an idea borrowed from Europe. Spain Italy and Germany all use it. In Germany there are enough wind mills and solar panel to match the capacity of the existing nuclear Powerstation and meet more than 20% of the German energy demand. On sunny and windy Sunday mornings there is more than 100% of renewable energy in Germany.

The payments are guaranteed for 20 - 25 years, they are Tax-free and index link. Feed-in tariffs are simply payments per kilowatt-hour for electricity generated by a renewable resource. In North America this simple idea is known by many different names: Electricity Feed Laws, Feed-in Laws, Feed-in Tariffs (FITs), Advanced Renewable Tariffs (ARTs), Renewable Tariffs, Renewable Energy Payments, and more recently CLEAN (for Clean Local Energy Accessible Now) contracts. Regardless of the name, they are the world's most successful policy mechanism for stimulating the rapid development of renewable energy.

Feed-in tariffs are also the most egalitarian method for determining where, when, and how much renewable generating capacity will be installed. Renewable Tariffs enable homeowners, farmers, cooperatives, and First Nations (Native North Americans) to participate on an equal footing with large commercial developers of renewable energy.

Electricity Feed Laws permit the interconnection of renewable sources of electricity with the electric-utility network and at the same time specify how much the renewable generator is paid for their electricity and over how long a period.

Electricity Feed Laws are widely used in Europe, most notably in Germany, France, and Spain. Geothermal feed-in tariffs worldwide vary from as low as $0.10/kWh for a 20-year contract in Spain to as much $0.40/kWh for a 20-year contract in Switzerland.

The secret of German energy policy: It is market orientated! The price of energy that is needed by an investor is calculated; this is the so called "Feed-in-tariff". To hinder this system becoming a bottomless pit and incalculable risk for the customers or an gold mine for the investor the prices are declining, i.e. the producers are forced to produce at lower level over the years. Nobody has to control whether the targets are reached. The market does not have to be regulated. Starting in 1991 until 2005 Germany did not need a regulator. If the calculation for the tariff was right the politicians just have to control from year to year whether the prices have to be changed. This had to be done concerning the feed in tariffs for PV due to reduced production costs of solar panels.

- Priortity access to the grid for all
- Long contracts (20-25 years typical)
- Prices differentiated by technology, size, application, resource intensity
- Prices determined by cost plus profit
- Fair but not excessive profit
- Inflation protection
- Periodic Review (every 2-4 years)

Feed-in tariff (FIT) guarantees a minimum payment for each unit of electricity you generate from renewable sources. This means that anybody wishes to invest in buying and installing eligible technologies can be confident that the cost of their investment will be recovered.

Customer Becomes Producer

A feed in tariff (also often referred to as a "feed-in tariff", "FiT," or "advanced renewable tariff") is a type of government policy that promotes renewable energy payments to entities that help generate renewable energy such as solar power, wind power, and geothermal power. The idea behind feed in tariffs is to eventually achieve "grid parity", which means to break the monopoly that huge energy producing companies hold on the traditional power grid in order to allow for renewable energy producers.

Under a typical feed in tariff policy, regional or national electric grid utility companies are given a government-mandated obligation to purchase renewable electricity from all eligible participants. The UK's new Feed-in Tariff Programme began in early April, 2010 and is often more well-known by the name "clean energy cash back."

Feed in tariff policies have been enacted in more than 63 nations in the world, including the UK and most of the members of the European Union. In recent years, a number of detailed analyses by the European Commission, the International Energy Agency, and others concluded that feed-in tariff regimes are generally the most efficient and effective support schemes for promoting renewable electricity. (http://www.renewableenergyworld.com/rea/news/article/2011/06/geothermal-feed-in-tariffs-worldwide).

The following chapter describes countries worldwide which are increasingly turning to feed-in tariffs as a mechanism to develop geothermal energy. In the wake of the disaster at the Fukishima nuclear reactors, for example, Japan's civil society has suggested expanding the countries limited feed-in tariff to include geothermal energy.

Similarly, renewable energy advocates have proposed expanding Great Britain's new feed-in tariff program to include geothermal development. As with feed-in tariffs for solar and wind energy, most of the activity is taking place in Europe.

Italy with more than 800 MW in operation is fifth in geothermal capacity installed worldwide and its Larderello field in Tuscany is a "must see" on any renewable energy "grand tour" of Europe.

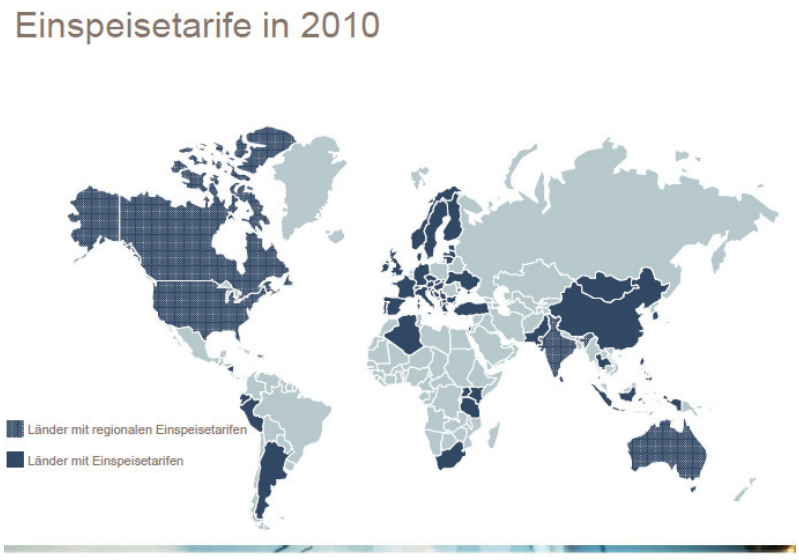

Figure 1. Countries with feed-in tariffs in 2010.

Italy has not chosen to emphasize new geothermal development. While Italy has an attractive feed-in tariff for geothermal, €0.20/kWh ($0.25/kWh), the tariff has been assigned to a small power ghetto along with small wind turbines. Italian policy limits the tariff for geothermal to projects less than 1 MW in size. This size limit is likely too small for any commercial projects.

On the other side of the Adriatic, Slovenia may be more attractive than Italy for generation. While Slovenia's tariff is lower, €0.15/kWh ($0.19/kWh), projects can be larger than those in Italy, up to 10 MW. Similarly, both Slovakia and France limit project size to less than 12 MW, but their tariffs are also as good as Italy's at €0.20/kWh.

Neither Switzerland nor Germany limits project size. Germany has one size tranche for geothermal: for less than 10 MW. Switzerland, on the other hand, uses four different size classes.

For projects less than 5 MW, Switzerland pays nearly €0.31/kWh ($0.39/kWh). This may be a typical project size for continental Europe outside of "hot spots" like Italy's Larderello field. For example, many of the geothermal projects under development in Germany are less than 5 MW each.

Outside of Europe, Africa and Asia has seen budding interest in using feed-in tariffs for geothermal. Taiwan recently revised its geothermal tariff to the equivalent of €0.12/kWh ($0.15/kWh).

Kenya and Uganda both have tariffs for geothermal energy, though Kenya's program doesn't offer a true feed-in tariff. The tariff in Kenya is a price ceiling rather than a minimum price. The final payment per kilowatt-hour in Kenya is negotiated.

Uganda, on the other hand, places a cap on annual geothermal development to control program costs. Geothermal development in Uganda is limited to 75 MW by 2014.

Table 1. Actual Geothermal Tariffs, worldwide examples.

Country	Years	Tariff, EURO / kWh
Switzerland (<5 MW)	20	0.489
France		
continental	20	0.200
overseas territories & Corsica	20	0.130
Croatia	12	0.168
Germany (<5 MW)	20	0.250 (since 2012) + 0.05 technology bonus for petrothermal
Greece	20	0.150
Taiwan	20	0.117
Ecuador		
continental	15	0.098
Galapagos	15	0.108
Kenya	20	0.089
Ukraine	10	0.080
Austria	13	0.075

Bonus Payments

Some countries, notably France and Germany, use a system of bonus payments or adders to encourage certain kinds of geothermal development, for example, district heating.

In France, geothermal projects receive a bonus payment for using the heat content in addition to the generation of electricity. The payment rate is on a sliding scale relative to the proportion of heat used. The maximum payment of €0.08/kWh ($0.10/kWh) is on top of the base rate.

Interestingly, France pays less for geothermal in its island territories where the electricity is far more valuable than in continental France. Many of France's overseas territories are volcanically active, for example Martinique, and the cost to develop geothermal energy is less as a high-temperature resource is close to the surface.

Successful feed-in tariffs are typically based on the "cost" to generate electricity and not on its "value". Germany uses a multiple bonus system. There has been a bonus payment for project completion before 2016, another bonus for district heating, and a third for developing Enhanced Geothermal Systems, such as hot dry rock. Geothermal projects developed in Germany within the next five years can expect payments from a low of €0.14/kWh ($0.20/kWh) for those greater than 10 MW in size to as much as €0.27/kWh ($0.38/kWh) for a power plant that also provides district heating from a deep geothermal resource. Germany has been debating new tariffs beginning in 2012 and geothermal tariffs have increased substantially to €0.25 /kWh ($0.36/kWh).

Current feed-in tariffs for geothermal generation worldwide are not too dissimilar to those proposed in a 2008 study for the California Energy Commission. For projects without federal or state subsidies, the tariffs necessary ranged from a low of $0.10/kWh (€0.08/kWh) to a high of $0.30/kWh (€0.24/kWh). See *Distributed Geothermal in California Can Add 7% of Supply.*

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Appendix A: Tables and Figures

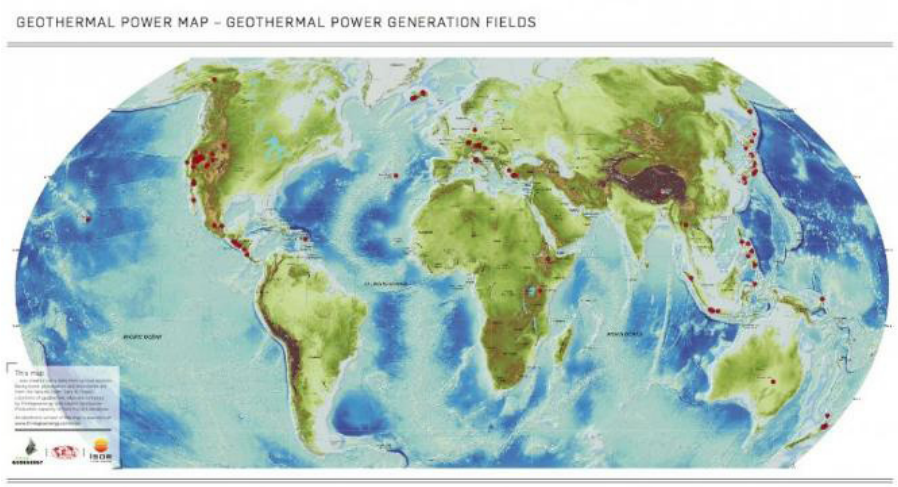

Figure 2. Worldwide Geothermal Power Generation Fields.

Figure 3. Countries with feed-in tariffs in 1990.

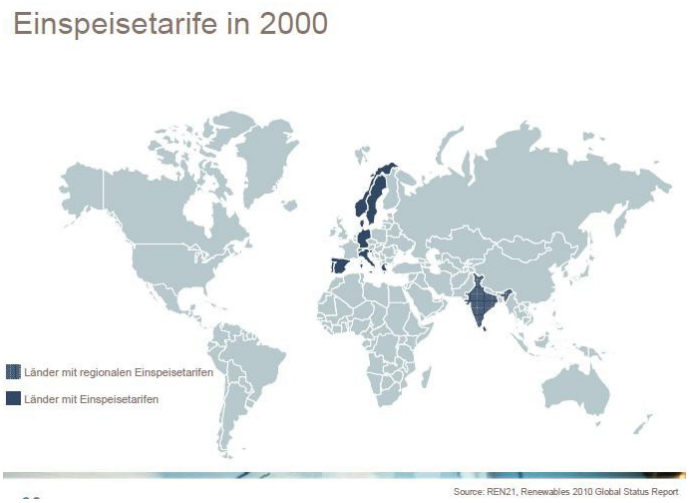

Figure 4. Countries with feed-in tariffs in 2000.

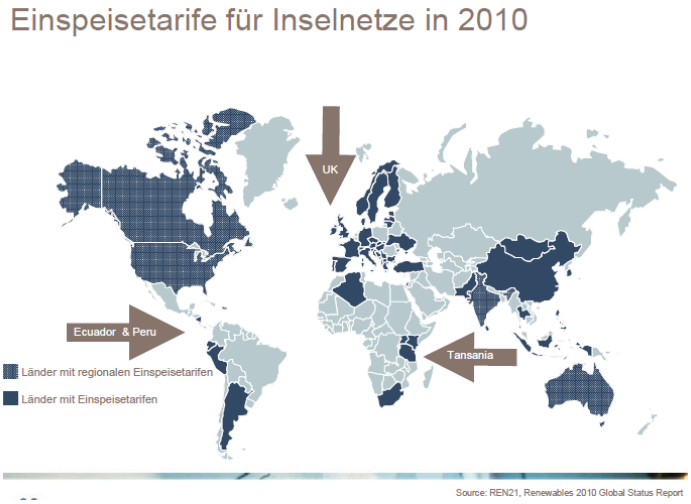

Figure 5. Countries with feed-in tariffs in 2010k, also for island-networks.

Table 2. Examples for Geothermal FiTs.

	Years	Tariff, EURO / kWh
Switzerland (<5 MW)	20	0.489
France		
continental	20	0.200
overseas territories & Corsica	20	0.130
Croatia	12	0.168
Germany (<10 MW)	20	0.250 (since 2012) + 0.05 technology bonus for petrothermal
Greece	20	0.150
Taiwan	20	0.117
Ecuador		
continental	15	0.098
Galapagos	15	0.108
Kenya	20	0.089
Ukraine	10	0.080
Austria	13	0.075

Table 3. Geothermal FiTs worldwide (Status 2011).

Geothermal Tariffs Worldwide Summary				
Jurisdiction	Years	Tariff €/kWh	1.3946 CAD/kWh	1.4390 USD/kWh
Germany	20			
<10 MW		0.157	0.219	0.226
>10 MW		0.103	0.144	0.148
Bonus for installation before 2016		0.039	0.055	0.056
District heating bonus		0.029	0.041	0.042
Technology bonus for hot-dry-rock		0.039	0.055	0.056
France				
Continental <12 MW	15	0.200	0.279	0.288
Plus premium for heat content				
<30%		0	0	0
		Linear interpolation		
>70% efficiency		0.080	0.112	0.115
Overseas Territories <12 MW	15	0.130	0.181	0.187
Plus premium for heat content				
<30%		0	0	0
		Linear interpolation		
>70% efficiency		0.03	0.042	0.043
Greece	20			
Mainland		0.081	0.114	0.117
Islands		0.097	0.135	0.140
Italy<1 MW	15	0.200	0.279	0.288
Spain <50 MW	20	0.071	0.099	0.102
	+20	0.067	0.094	0.097
Slovakia	12	0.196	0.273	0.282
Slovenia	15			
<50 kW		0.152	0.213	0.219
>50 kW<1,000 kW		0.152	0.213	0.219
>1 MW<10 MW		0.152	0.213	0.219
>10 MW<125 MW			n/a	
Switzerland	20			
<5 MW		0.309	0.432	0.445
<10 MW		0.279	0.388	0.401
<20 MW		0.217	0.302	0.312
>20 MW		0.176	0.245	0.253
Croatia	12			
<1 MW		0.174	0.242	0.250
>1 MW		0.174	0.242	0.250
Czech Republic	15	0.158	0.220	0.227
Kenya <70 MW*	20	0.059	0.082	0.085
Serbia	12	0.075	0.105	0.108
Taiwan		0.121	0.169	0.174
Turkey	10	0.073	0.102	0.105
Bonus for Made in Turkey				
Steam or gas turbine		0.009	0.013	0.013
Generator & power electronics		0.049	0.068	0.070
Steam injector or gas compressor		0.049	0.068	0.070
Uganda	20	0.054	0.075	0.077
*Ceiling price rather than minimum price.				

Table 4. California Geothermal Prices Needed.

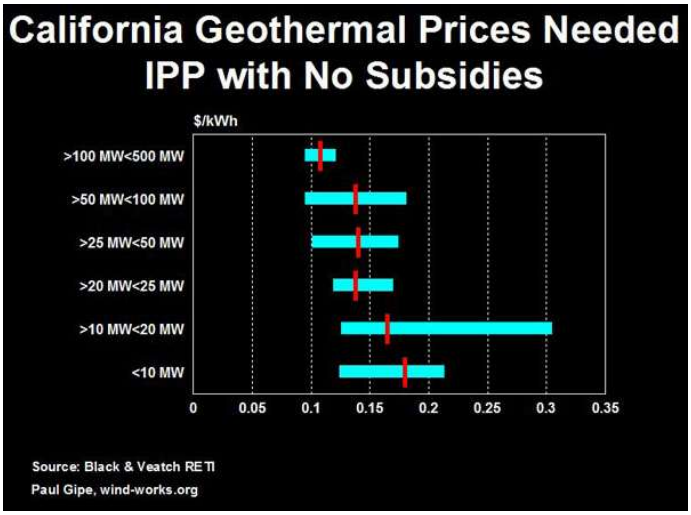

Table 5. FiT in Austria.

Type of generating capacity	Years	Tariff, EURO / kWh
Solar		
up to 5 kW	10	0.460
from 5 kW to 10 kW	10	0.400
over 10 kW	10	0.300
Biomass		
up to 500 kW	15	0.150
from 500 kW to 1 MW	15	0.135
from 1 MW to 1.5 MW	15	0.131
from 1.5 MW to 2 MW	15	0.130
from 2 MW to 5 MW	15	0.123
from 5 MW to 10 MW	15	0.121
over 10 MW	15	0.100
Biogas		
up to 250 kW	15	0.185
from 250 kW to 500 kW	15	0.165
over 500 kW	15	0.130
Landfill gas	13	0.050
Wind	13	0.097
Geothermal	**13**	**0.075**

Table 6. FiT in Belgium.

Type of generating capacity	Years	Tariff, EURO / kWh
Solar		
first 5 kW	15	0.455
next 5 kW	15	0.325
next 240 kW	15	0.260
over 250 kW	15	0.100
Biomass	10	0.080
Biogas	10	0.125
Wind	10	0.090

Table 7. FiT in Bosnia and Herzegovina.

Type of generating capacity	Years	Tariff, BAM / kWh	Tariff, EURO / kWh
Solar	12	0.12	0.061

Table 8. FiT in Bulgaria.

Type of generating capacity	Years	Tariff, BGN / kWh	Tariff, EURO / kWh
Solar			
up to 5 kW	25	0.823	0.420
over 5 kW	25	0.755	0.386
Wind			
up to 800 kW	15	0.149	0.076
over 800 kW	15	0.172	0.088
Hydro			
up to 200 kW	15	0.223	0.114
from 200 kW to 10 MW	15	0.213	0.109
Biomass			
up to 5 MW	15	0.252	0.129
over 5 MW	15	0.219	0.112
Biogas			
up to 150 kW	15	0.424	0.217
from 150 kW to 500 kW	15	0.397	0.203
from 500 kW to 5 MW	15	0.303	0.155

Table 9. FiT in Canada.

Type of generating capacity	Years	Tariff, USD / kWh	Tariff, EURO / kWh
Solar			
Ontario			
up to 10 kW	20	0.78	0.580
from 10 kW to 250 kW	20	0.69	0.510
from 250 kW to 500 kW	20	0.62	0.460
over 500 kW	20	0.52	0.390
Prince Edward Island	20	0.075	0.056
Wind			
Nova Scotia	20	0.127	0.094
Ontario	20	0.131	0.100
Biomass			
Nova Scotia	20	0.170	0.126
Ontario	20	0.119	0.090
Hydro			
Nova Scotia	20	0.136	0.101
Ontario	40	0.119	0.090

Table 10. FiT in China.

Type of generating capacity	Years	Tariff, CNY / kWh	Tariff, EURO / kWh
Solar	?	1.09	0.128
Wind			
category 1 energy zone	?	0.51	0.059
category 2 energy zone	?	0.54	0.063
category 3 energy zone	?	0.58	0.067
category 4 energy zone	?	0.61	0.071
Biogas	?	0.75	0.087

Table 11. FiT in Croatia.

Type of generating capacity	Years	Tariff, HRK / kWh	Tariff, EURO / kWh
Solar			
up to 10 kW	12	3.40	0.454
from 10 kW to 30 kW	12	3.00	0.400
over 30 kW	12	2.10	0.280
Biomass			
up to 1 MW	12	0.95	0.127
over 1 MW	12	0.83	0.111
Geothermal			
up to 1 MW	12	1.26	0.168
over 1 MW	12	1.26	0.168
Wind			
up to 1 MW	12	0.64	0.086
over 1 MW	12	0.65	0.087

Table 12. FiT in Cyprus.

Type of generating capacity	Years	Tariff, EURO / kWh
Solar		
up to 20 kW	15	0.360
from 20 kW to 150 kW	15	0.340
Biomass	20	0.135
Biogas	20	0.115
Wind	20	0.166

Table 13. FiT in Czech Republic.

Type of generating capacity	Years	Tariff, CZK / kWh	Tariff, EURO / kWh
Solar			
up to 30 kW	20	12.15	0.476
over 30 kW	20	12.25	0.479
Biomass / biogas			
01 category	15	4.49	0.175
02 category	15	3.46	0.135
03 category	15	2.57	0.100
Wind	15	2.34	0.091
Geothermal		**4,50**	**0.18**
Small hydropower plants (capacity <10 kW)	15	2.70	0.106

Table 14. FiT in Ecuador.

Type of generating capacity		Years	Tariff, EURO / kWh
Continental			
	Solar	15	0.297
	Biomass		
	up to 5 MW	15	0.082
	over 5 MW	15	0.071
	Biogas		
	up to 5 MW	15	0.082
	over 5 MW	15	0.071
	Geothermal	**15**	**0.098**
	Hydro		
	up to 10 MW	15	0.053
	from 10 MW to 30 MW	15	0.051
	from 30 MW to 50 MW	15	0.046
	Wind	15	0.068
Galapagos	Solar	15	0.326
	Biomass		
	up to 5 MW	15	0.090
	over 5 MW	15	0.078
	Biogas		
	up to 5 MW	15	0.090
	over 5 MW	15	0.078
	Geothermal	**15**	**0.108**
	Wind	15	0.074

Table 15. FiT in Finland.

Type of generating capacity	Years	Tariff, EURO / kWh
Solar	12	Available upon request
Wind	12	0.084
Biogas	12	0.084

Table 16. FiT in France.

Type of generating capacity	Years	Tariff, EURO / kWh
Solar		
BIPV (dwellings and health care)	20	0.580
BIPV (other buildings)	20	0.500
simplified BIPV	20	0.420
ground-mounted in the sunny south	20	0.314
ground-mounted in the cloudy north	20	0.377
Biomass	20	0.125
Biogas		
up to 150 kW	20	0.161
from 150 kW to 300 kW	20	0.143
from 300 kW to 500 kW	20	0.132
from 500 kW to 1 MW	20	0.118
from 1 MW to 2 MW	20	0.113
Wind		
continental	20	0.082
overseas territories & Corsica	20	0.110
Geothermal (+70% in 2010)		
continental	**20**	**0.200**
overseas territories & Corsica	**20**	**0.130**

Table 17. FiT in Germany.

Type of generating capacity	Years	Tariff, EURO / kWh
Solar		
up to 30 kW	20	0.287
from 30 kW to 100 kW	20	0.273
from 100 kW to 1 MW	20	0.259
over 1 MW	20	0.216
Biomass		
up to 150 kW	20	0.114
from 150 kW to 500 kW	20	0.090
from 500 kW to 5 MW	20	0.080
from 5 MW to 20 MW	20	0.076
Biogas		
up to 150 kW	20	0.114
from 150 kW to 500 kW	20	0.090
from 500 kW to 5 MW	20	0.080
from 5 MW to 20 MW	20	0.076
Landfill gas		
up to 500 kW	20	0.087
from 500 kW to 5 MW	20	0.059
Wind	20	0.090
Geothermal		
up to 5 MW		**0.25**
from 5 MW to 10 MW		**0.156**
from 10 MW to 20 MW		**0.102**
over 20 MW		**0.102**
	since 2012	**0.250 + 0.04 Petrothermal bonus**
Hydro		
up to 500 kW	20	0.126
from 500 kW to 2 MW	20	0.086
from 2 MW to 5 MW	20	0.076

Table 18. FiT in Great Britain.

Type of generating capacity	Years	Tariff, GBP / kWh	Tariff, EURO / kWh
Solar			
up to 4 kW (new building)	25	0.378	0.433
up to 4 kW (retrofit)	25	0.433	0.496
from 4 kW to 10 kW	25	0.378	0.433
from 10 kW to 50 kW	25	0.329	0.377
from 50 kW to 150 kW	25	0.190	0.218
from 150 kW to 250 kW	25	0.150	0.172
from 250 kW to 5 MW	25	0.085	0.097
stand alone (IPP or greenfield)	25	0.085	0.097
Wind			
up to 1.5 kW	20	0.362	0.415
from 1.5 kW to 15 kW	20	0.280	0.321
from 15 kW to 100 kW	20	0.253	0.290
from 100 kW to 500 kW	20	0.197	0.226
from 500 kW to 1.5 MW	20	0.099	0.113
from 1.5 MW to 5 MW	20	0.047	0.054
Hydro			
up to 10 kW	20	0.209	0.239
from 10 kW to 100 kW	20	0.187	0.214
from 100 kW to 2 MW	20	0.115	0.132
from 2 MW to 1 MW	20	0.047	0.054
Biomass			
up to 45 kW	15	0.090	0.103
from 45 kW to 500 kW	15	0.065	0.074
over 500 kW	15	0.025	0.029
Biogas			
up to 45 kW	10	0.055	0.063
from 45 kW to 200 kW	10	0.055	0.063

Greece

Table 19. FiT in Greece.

Type of generating capacity	Years	Tariff, EURO / kWh
Solar		
mainland		
up to 100 kW	20	0.441
over 100 kW	20	0.392
islands		
up to 100 kW	20	0.441
Biomass		
up to 1 MW	20	0,200
from 1 MW to 5MW	20	0,175
over 5 MW	20	0,150
Biogas		
up to 3 MW	20	0.220
over 3 MW	20	0.200
Wind		
mainland	20	0.088
islands	20	0.099
Geothermal	**20**	**0.150**
Hydro	20	0.088

Table 20. FiT in Hungary.

Type of generating capacity	Years		Tariff, HUF / kWh	Tariff, EURO / kWh
Solar	?		26.5	0.086
Biomass	?		39.6	0.129
Geothermal projects approved after 01.01.2008			33.4	
	< 20 MW	Hauptzeit:	33,35	
		Nebenzeit:	29,84	
		Tiefzeit:	12,18	
	20 to 50 MW	Hauptzeit:	26,67	
		Nebenzeit:	23,88	
		Tiefzeit:	9,74	
	>50 MW	Hauptzeit:	20,74	
		Nebenzeit:	13,27	
		Tiefzeit:	13,27	

Table 21. FiT in India.

Type of generating capacity	Years	Tariff, INR / kWh	Tariff, EURO / kWh
Solar			
up to 20 kW	10	12.36	0.178
from 20 kW to 100 kW	10	10.29	0.148
Gujarat	12	13.89	0.200
proposed tariff (2012)	25	19.40	0.279
Biomass	10	4.36	0.063
Wind			
from 50 kW to 100 kW	10	7.22	0.104
from 100 kW to 1 MW	10	5.42	0.078
from 1 MW to 100 MW	10	3.89	0.056

Table 22. FiT in Iran.

Type of generating capacity	Years	Tariff, IRR / kWh	Tariff, EURO / kWh
Solar			
peak and medium load	?	1300	0.089
20 hours per day			
low load 4 hours per day	?	900	0.061

Table 23. FiT in Ireland.

Type of generating capacity	Years	Tariff, EURO / kWh
Solar	15	0.190
Biomass	15	0.083
Wind		
onshore		
up to 5 MW	15	0.068
over 5 MW	15	0.066
offshore	15	0.140
Landfill gas	15	0.081
Hydro	15	0.083

Table 24. FiT in Israel.

Type of generating capacity	Years	Tariff, NIS / kWh	Tariff, EURO / kWh
Solar			
up to 50 kW	20	1.97	0.388
over 50 kW	20	1.58	0.311
Renewable energy	20	0.45	0.088
Wind			
up to 15 kW	20	1.27	0.250
from 15 kW to 50 kW	20	1.62	0.320

Table 25. FiT in Japan.

Type of generating capacity	Years	Tariff, JPY / kWh	Tariff, EURO / kWh
Solar	15	50.00	0.482
Wind	15	20.02	0.193
Geothermal:	15	42.00 to 1.5 MW	0,404
	15	27.30 more 1.5 MW	0,263
			Since July 2012

Table 26. FiT in Kenya.

Type of generating capacity	Years	Tariff, KES / kWh	Tariff, EURO / kWh
Solar			
from 500 kW to 10 MW (firm)	20	17.80	0.148
from 500 kW to 10 MW (non firm)	20	8.90	0.074
Wind			
from 500 kW to 100 MW	20	10.70	0.089
Hydro			
firm			
from 500 kW to 1 MW	20	10.70	0.089
from 1 MW to 5 MW	20	8.90	0.074
from 5 MW to 10 MW	20	7.09	0.059
non firm			
up to 1 MW	20	8.90	0.074
from 1 MW to 5 MW	20	7.09	0.059
from 5 MW to 10 MW	20	5.29	0.044
Biomass			
from 500 kW to 100 MW (firm)	20	7.09	0.059
from 500 kW to 100 MW (non firm)	20	5.29	0.044
Biogas			
from 500 kW to 40 MW (firm)	20	7.09	0.059
from 500 kW to 40 MW (non firm)	20	5.29	0.044
Geothermal			
up to 70 MW	20	10.70	0.089

Table 27. FiT inLuxembourg.

Type of generating capacity	Years	Tariff, EURO / kWh
Solar		
up to 30 kW	20	0.420
from 30 kW to 1 MW	20	0.370
Biomass		
up to 1 MW	15	0.144
from 1 MW to 5 MW	15	0.124
Biogas		
from 150 kW to 300 kW	20	0.149
from 300 kW to 500 kW	20	0.139
from 500 kW to 2.5 MW	20	0.119
Wind	15	0.082
Hydro		
up to 1 MW	15	0.104
from 1 MW to 6 MW	15	0.084

Table 28. FiT in Malysia.

Type of generating capacity	Years	Tariff, MYR / kWh	Tariff, EURO / kWh
Solar			
up to 4 kW	21	1.23	0.288
from 4 kW to 24 kW	21	1.20	0.281
from 24 kW to 72 kW	21	1.18	0.276
from 72 kW to 1 MW	21	1.14	0.267
from 1 MW to 10 MW	21	0.95	0.222
from 10 MW to 30 MW	21	0.85	0.199
	21		
Biomass			
up to 10 MW	16	0.31	0.073
from 10 MW to 20 MW	16	0.29	0.068
from 2 MW to 30 MW	16	0.27	0.063
Biogas			
up to 4 MW	16	0.32	0.075
from 4 MW to 10 MW	16	0.30	0.070
from 10 MW to 30 MW	16	0.28	0.066
Hydro			
up to 10 MW	21	0.24	0.056
from 10 MW to 30 MW	21	0.23	0.054

Table 29. FiT in Malta.

Type of generating capacity	Years	Tariff, EURO / kWh
Solar		
residential	8	0.250
nonresidential	8	0.200
residential (Gazo)	8	0.280
nonresidential (Gazo)	8	0.200

Table 30. FiT in Mongolia.

Type of generating capacity	Years	Tariff, EURO / kWh
Solar	10	0.222
Wind	10	0.111
Hydro		
up to 1 MW	10	0.074
from 1 MW to 2 MW	10	0.044
over 2 MW	10	0.037

Table 31. FiT in Nicaragua. -

Type of generating capacity	Years	Tariff, NIO / kWh	Tariff, EURO / kWh
Solar	?	9.42	0.412

Table 32. FiT in Portugal.

Type of generating capacity	Years	Tariff, EURO / kWh
Solar		
up to 5 kW	15	0.420
over 5 kW	15	0.320
Biomass	25	0.119
Biogas	15	0.115
Landfill gas	15	0.102
Hydro		
up to 10 MW	25	0.095
from 10 MW to 20 MW	25	0.091

Table 33. FiT in South Korea.

Type of generating capacity	Years	Tariff, KRW / kWh	Tariff, EURO / kWh
Solar			
up to 30 kW	20	571.95	0.369
from 30 kW to 200 kW	20	545.95	0.352
from 200 kW to 1 MW	20	536.04	0.345
over 1 MW	20	509.24	0.328
Wind	20	193.31	0.085
Landfill gas			
up to 20 MW	20	80.70	0.052
from 20 MW to 50 MW	20	76.05	0.049
Hydro	20	90.02	0.058

Table 34. FiT in Sri Lanka.

Type of generating capacity	Years	Tariff, LKR / kWh	Tariff, EURO / kWh
Wind	1-8	23.07	0.156
	9-15	10.29	0.069
	>16	4.71	0.032
Hydro	1-8	14,25	0,096
	9-15	6,77	0,046
	>16	3,29	0,022
Biomass	1-8	17,97	0,121
	9-15	4,94	0,033
	>16	3,29	0,022

Table 35. FiT in Switzerland.

Type of generating capacity	Years	Tariff, SWF / kWh	Tariff, EURO / kWh
Solar			
ground-mounted			
up to 10 kW	25	0.427	0.522
from 10 kW to 30 kW	25	0.393	0.480
from 30 kW to 100 kW	25	0.343	0.419
from 100 kW to 1 MW	25	0.305	0.373
over 1 MW	25	0.289	0.353
rooftop			
up to 10 kW	25	0.483	0.590
from 10 kW to 30 kW	25	0.467	0.571
from 30 kW to 100 kW	25	0.422	0.516
from 100 kW to 1 MW	25	0.378	0.462
over 1 MW	25	0.361	0.441
building integrated			
up to 10 kW	25	0.592	0.723
from 10 kW to 30kW	25	0.542	0.662
from 30 kW to 100 kW	25	0.459	0.561
from 100 kW to 1 MW	25	0.415	0.507
over 1 MW	25	0.391	0.478
Wind			
up to 10 kW	20	0.200	0.244
over 10 kW	20	0.200	0.244
Hydro			
up to 10 kW	25	0.260	0.318
from 10 kW to 50 kW	25	0.200	0.244
from 50 kW to 300 kW	25	0.145	0.177
from 300 kW to 1 MW	25	0.110	0.134
from 1 MW to 10 MW	25	0.075	0.092
Geothermal			
up to 5 MW	**20**	**0.400**	**0.489**
from 5 MW to 10 MW	**20**	**0.360**	**0.440**
from 10 MW to 20 MW	**20**	**0.280**	**0.342**
over 20 MW	**20**	**0.227**	**0.277**

Table 36. FiT in Taiwan.

Type of generating capacity	Years	Tariff, NT / kWh	Tariff, EURO / kWh
Solar			
up to 10 kW	20	14.60	0.357
from 10 kW to 500 kW	20	12.97	0.317
over 500 kW	20	11.12	0.272
Wind			
onshore			
up to 10 kW	20	7.36	0.180
over 10 kW	20	2.61	0.063
offshore	20	5.56	0.136
Geothermal	20	4.80	0.117
Biomass	20	2.18	0.053

Table 37. FiT in Thailand.

Type of generating capacity	Years	Tariff, THB / kWh	Tariff, EURO / kWh
Solar	10	10.12	0.240
Wind			
up to 50 kW	10	4.50	0.107
over 50 kW	10	3.50	0.083
Hydro			
up to 50 kW	7	1.50	0.036
from 50 kW to 200 kW	7	0.80	0.019
Biomass			
up to 1 MW	7	0.50	0.012
over 1 MW	7	0.30	0.007
Biogas			
up to 1 MW	7	0.50	0.012
over 1 MW	7	0.30	0.007

Table 38. FiT in Ukraine.

Type of generating capacity	Years	Tariff, UAH / kWh	Tariff, EURO / kWh
Solar			
up to 100 kW	10	4.81	0.446
over 100 kW	10	4.60	0.427
Biomass	10	1.42	0.132
Wind			
up to 600 kW	10	0.70	0.064
from 600 kW to 2 MW	10	0.81	0.075
over 2 MW	10	1.22	0.113
Small hydropower plants (capacity <10 kW)	10	0.89	0.083
Geothermal	**10**	**0.85**	**0.080**

Table 39. FiT in USA.

Type of generating capacity	Years	Tariff, USD / kWh	Tariff, EURO / kWh
Solar			
California	3	0.48	0.370
Florida			
up to 10 kW	20	0.30	0.237
from 10 kW to 25 kW	20	0.28	0.215
over 25 kW	20	0.23	0.178
Hawaii	20	0.26	0.203
Michigan	12	0.43	0.333
New Mexico	12	0.20	0.156
Rhode Island			
from 10 kW to 150 kW	15	0.32	0.247
from 150 kW to 500 kW	15	0.30	0.234
from 500 kW to 5 MW	15	0.28	0.215
Texas	20	0.26	0.200
Tennessee	10	0.19	0.146
Vermont	25	0.30	0.222
Washington	8	0.61	0.452
Wisconsin	10	0.25	0.185
Wind			
Hawaii	20	0.14	0.102
Minnesota	1-10	0.04	0.035
	11-20	0.03	0.024
Rhode Island	15	0.13	0.099
Vermont			
up to 50 kW	20	0.20	0.148
from 50 kW to 2.2 MW	20	0.13	0.093
Washington	8	0.41	0.304
Hydro			
Hawaii	20	0.19	0.140
Vermont	20	0.13	0.093
Biomass			
Vermont	20	0.13	0.093
Biogas			
Washington	8	0.15	0.111