>> Support schemes and their influence on PV markets

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>> In most applications and regions, the price of PV electricity is still more costly compared with fossil and nuclear power. Therefore, support schemes currently play an important and necessary role for the development ofglobal PV markets and will do so in the coming years. Germany boasts the most dynamic PV market in the world which is strongly driven by a feed-in tariff system. Due to this great success, many other countries arebegining to establish similar feed-in tariff systems. However, experiences in Spain and Italy, for example, show that apart from a well-designed feed-in tariff, other important factors promote and possibly preventmarket success.

In contrast to the success of Germany, Japan and the United States of America have the second and the third largest PV markets worldwide without employing a feed-in tariff system. In California, a combination of grants, tax reductions, and net metering make the investment in PV financially attractive. In other US states renewable portfolio standards with set-asides are seen as a powerful way to develop the PV market. In Japan, the successful residential subsidy program was terminated in 2006. The government expected further market growth without continuing subsidy; but ever since, the Japanese PV market has stagnated.

Feed-in tariffs are obviously a very powerful tool to help develop PV markets, but there are other factors that play a role as well. These factors need to be considered carefully. Furthermore, PV Markets can also be successfully stimulated by support schemes other than the feed-in tariff if they fulfill specific criteria. This presentation attempts to provide an overview. <<

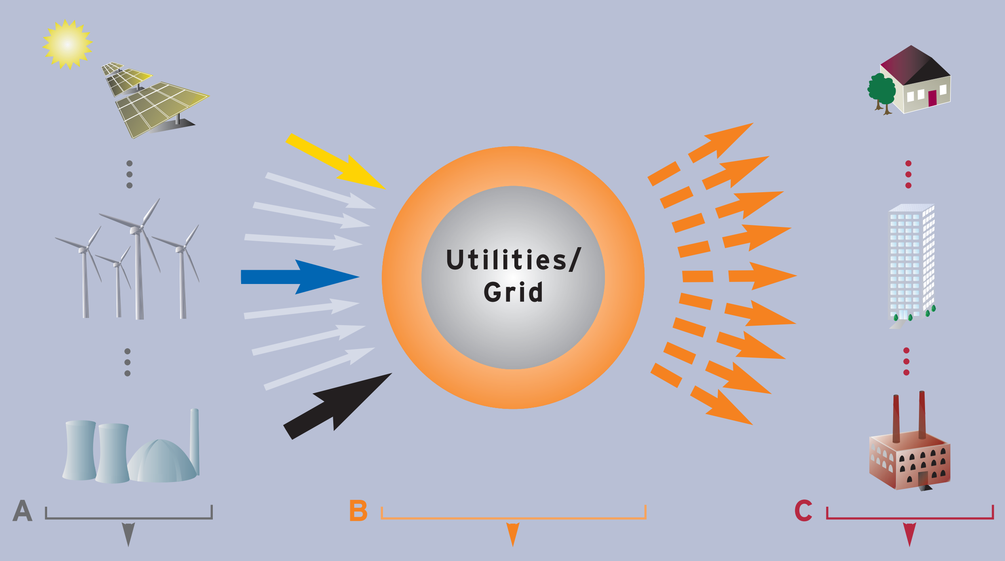
1 >> Why a broad market introduction of PV?

All studies show: PV will be necessary for the future energy supply system. Therefore, systematic market introduction measures with specific support schemes should be initiated now in order to

- **compensate the today's higher costs for PV electricity** and make PV investments financially attractive
- **decrease the costs of PV technology** through mass production and technological development
- **provide sufficient PV capacities** in production, distribution and installation in the future

2 >> Which are the best support schemes?

There are different approaches to support the PV market introduction:



	A	B	C
Target group	**Investors for power production systems** (Create access to this market for private and commercial investors)	**Utilities**	**Electricity consumers** Aim: reduce consumption
Concept	Investment in PV system becomes financially attractive; guaranteed prices for the sale of solar electricity are established	Obliged to produce/purchase a certain amount of solar electricity	Create incentives to produce electricity for own consumption and reduce the usage of conventional electricity
Scheme	Feed-in tariff	Quotas / Certificates	Grants and tax incentives
Funding	Redistribution of additional costs => all electricity consumers are charged (no state subsidies required)		State budget => all taxpayers

3 >> Effective PV support is dependent on different framework conditions

Previous experiences show certain tendencies:

- feed-in tariffs stimulate markets most effectively
- quotas induce only slow demand
- grants and tax incentives are efficient only during the initial stage of the market introduction when necessary funds are still limited
- mixed systems are efficient only when all single elements complement each other

>> PV Support in EU Member States

	Feed-in tariff [€ct/kWh] Subsidy program	Market size 2006 [in MWp]	Targets
Germany	FIT: 37.96 - 54.21	750	20 % RES-E in 2010
Spain	FIT: 23 - 44	60	371 MWp in 2010
Italy	FIT: 36 - 49	12	3000 MWp
France	FIT: 30 - 55 50 % tax reduction max 8000/16000 € Grants in some regions	12	490 MWp in 2015
Greece	FIT: 40 - 50 20 % - 60 % grants for commercial plants	1,25 [25 % grid connected]	700 MWp in 2020
Austria	FIT: 30-46 (capped)	5	78,1 % RES-E in 2010
UK	Tradable green certificates / Grants of up to 50 %	2,75	10 % RES-E in 2010
Belgium	Green Certificates 15 (National) - 45 (Flanders)	2,1	6 % RES-E in 2010
Sweden	Tradable Certificate System / Grants of up to 70 %	0,65	60 % RES-E in 2010
Cyprus	Investment grant + 20,8 FIT or no grant and 38,8 FIT	0,52	6 % RES-E in 2010
Portugal	FIT: 32 - 45 but application procedure terminated	0,47	39 % RES-E in 2010
The Netherlands	Tax Incentives	0,45	9 % RES-E in 2010
Ireland	FIT exists, but not for PV	0,2 (in 2005)	15 % RES-E in 2010
Czech Republic	FIT: 48,1	0,241	8 % RES-E in 2010
Denmark	< 6kW: net metering > 6kW: Market price + 5,4 - 8	0,23	29 % RES-E in 2010
Slovenia	FIT: 37,42 or premium of 33,66 on top of market price	0,183	33,6 % RES-E in 2010
Poland	FIT and green certificates	0,114	7,5 % RES-E in 2010
Finland	up to 40 % grants	0,064	31,5 % RES-E in 2010
Luxembourg	FIT: 28 - 56 (until 12/2007)	0,042	5,7 % RES-E in 2010
Hungary	FIT: 9,6 (until 12/2010)	0,017 (in 2005)	3,6 % RES-E in 2010
Malta	FIT: 7 + net metering	0,033	5 % RES-E in 2010
Lithuania	FIT: exists, but not for PV	0,023	7 % RES-E in 2010
Estonia	FIT: 5,1	0,005	5,1 % RES-E in 2010
Slovakia	FIT: 24,4	0,004	31 % RES-E in 2010
Latvia	FIT, amount negotiable	0,001	49,3 % RES-E in 2010
Romania	Green Certificates / Quotas / Investment grants	?	33 % RES-E in 2010
Bulgaria	FIT: 36,7 - 40	?	11 % RES-E in 2010

4 >> Support schemes need to be adapted to the specific market stage of the country

Individual developments exist for different actors in specific market stages:

	Stage 0 Demonstration >>	Stage 1 Niche market >>	Stage 2 Beginning of broad market >>
Dealer/ Installer	Few specialists	Network of specialists Training required	Specialists and increasingly conventional providers Training required
Customer	Few users	First mover Awareness raising required	Development of new customer groups Awareness raising required
Energy supplier	No experience, high security needs	First experiences, resistance against market introduction	Standardization of PV integration and PV grid access
Media	No coverage	Very little coverage, PV „exotic"	Increasing coverage
Financial sector	No offers	Few offers, high surcharge	Obligation of specific financing conditions
Legislation	Exceptional rule	Rules for grid access and feed-in of PV electricity	Rising feed-in tariffs
Support scheme	Demonstration program	Grants / tax incentives	Feed-in law
Motivation for Investors	Want to show the technology works	Use of solar power for own consumption	Realization of profits

5 >> Order for decision taking when choosing a PV support scheme

a. The setting of clear targets >>
- Security of supply (mid-/long-term)
- Protection of climate/environment
- Capacity building: Development of solar markets, technological experiences
- Development of an industrial sector

b. The setting of long-term targets for RE and PV >>
- Define share of PV in electricity production
- Decide on RE technology mix

c. Start market build-up >>
- Create best practice: demonstration projects
- Stimulate demand: Grants / tax incentives
- Train installers
- Create legal framework: Clarify conditions for grid connection
- Public awareness raising

d. Develop broader market >>
- Improve feed-in tariffs
- Continue awareness raising campaign
- Train installers
- Make long-term PV policy

e. Continuous Evaluation >>
- Check progress
- Adapt tools / optimize legal framework

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