

Housing as Power Plants: Solar Energy feeding back to grid

GREEN HOUSING AND GREEN JOBS – BRUXELLES 2009



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BEC-Engineering GmbH

- Engineering office which provides innovative services in the field of renewable energy
 - Project Planning
 - Classical Engineering
 - On-Site Investigations and Measurements
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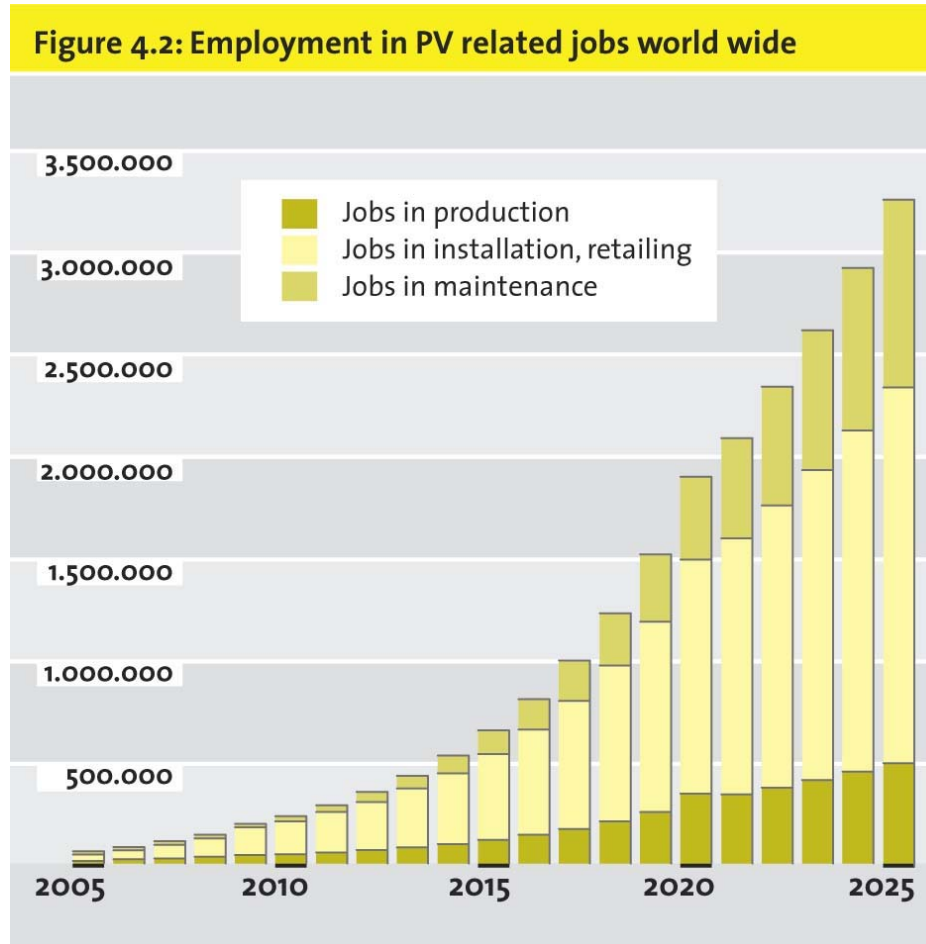
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Photovoltaic (PV) – Pro and Contra

- + Direct convert from sunlight to electrical energy
- + CO₂-Reduction
- + Higher energy independence (no fuel required)
- + No emission of noise or gas
- + Improvement of grid quality and stability
- + Feed in to public grid corresponding to load curve
- + Increasing the security of energy supply
- + Easy to install on existing and new housings
- + Job creation
- + Rural development
- Not yet competitive with conventional power sources

PV related jobs world wide



Date: 09.02.2009

Source: EPIA 2006

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PV feeding in correlation with load curve

PV -> peak load power

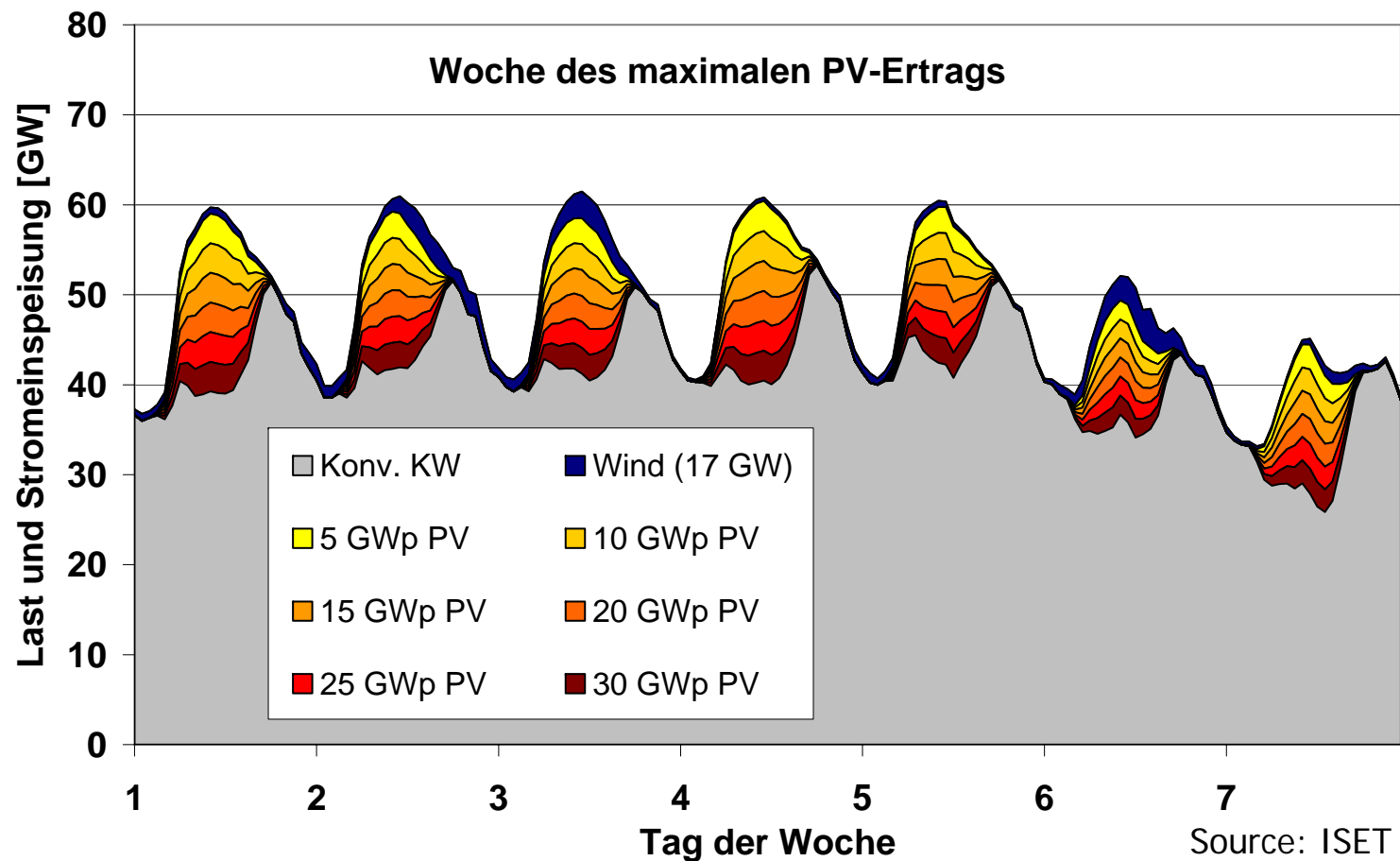
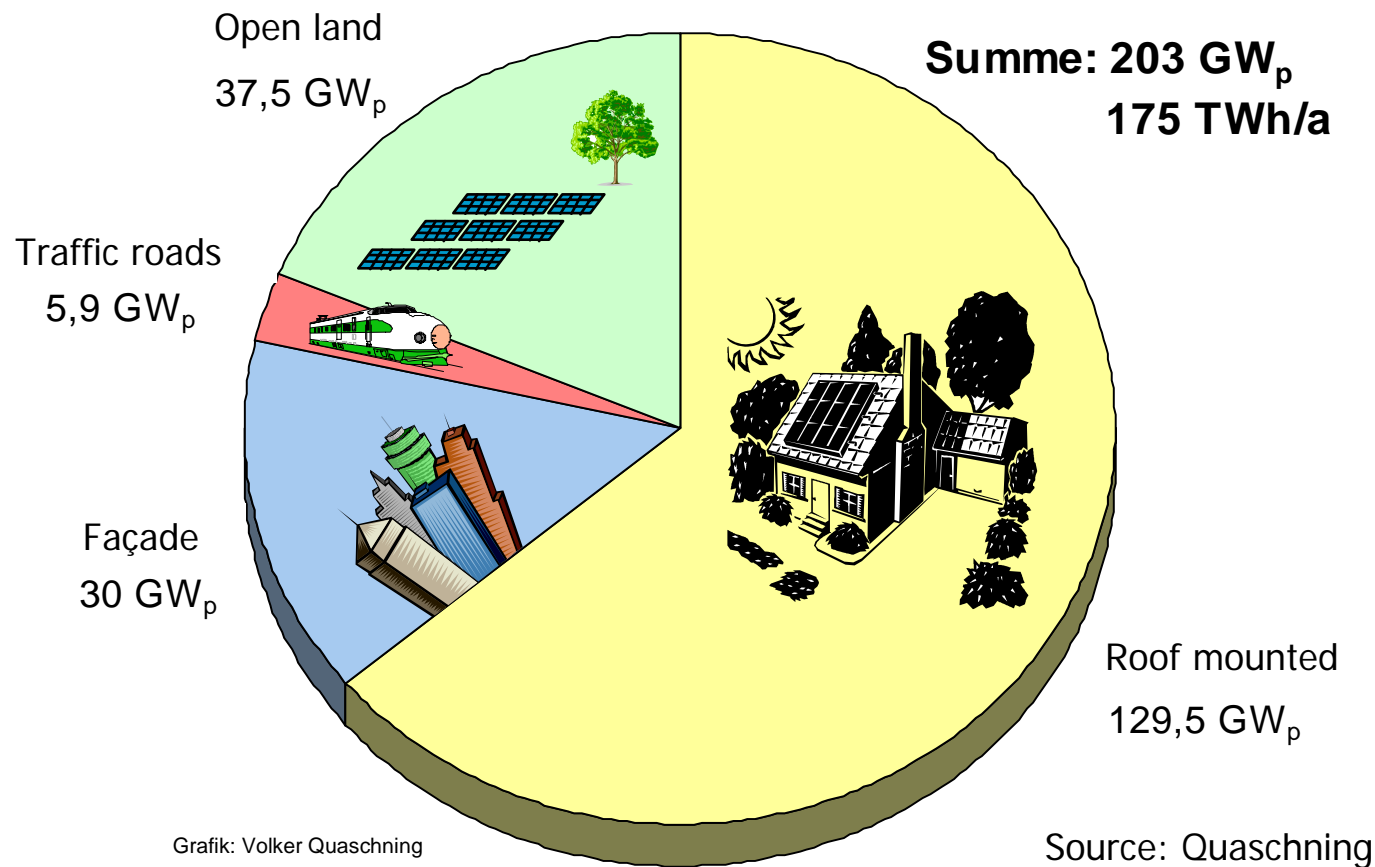


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Photovoltaic Potential in Germany



More than 75% are housing power plants

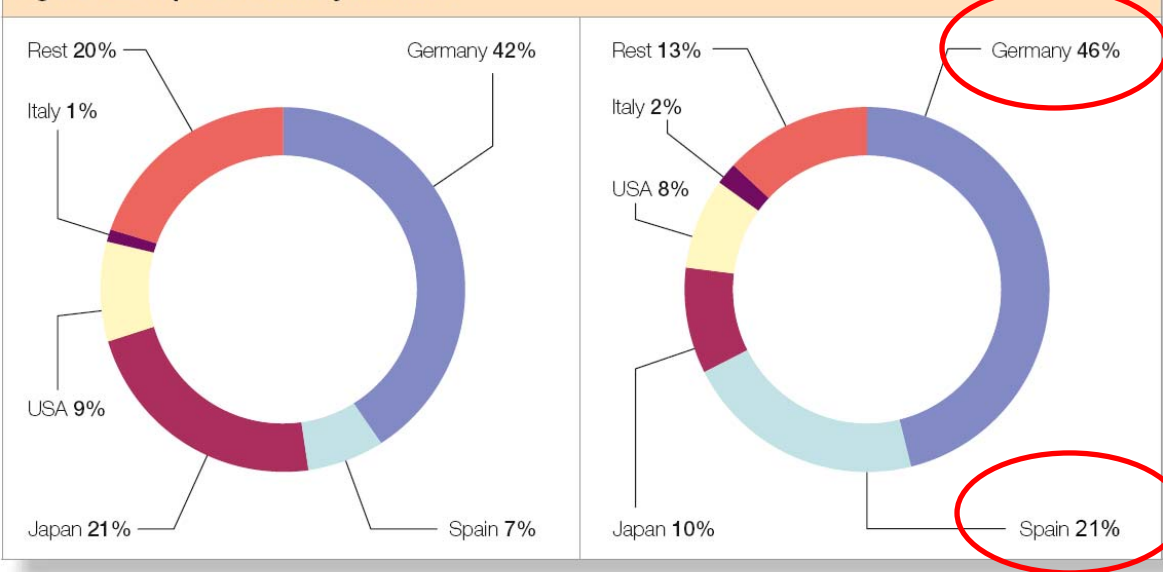
German Renewable Energy Sources Act (EEG)

- Legal regulation for PV feed-in (compensation fixed for 20 years including commissioning year)
- Introduced in year 2000 (first version in 1991)
- High compensation and therefore a rentable investment
- Clear regulation for grid connection
- Job creation, „Solarteure“
- High Quality standards through national and international regulations

➤ EEG – a role model for other countries (e.g. Spain)

PV in Germany – great success story

Figure 2.3: Top 5 PV country markets



Top 5 Total installed capacity 2007 (MW)

Germany	3,800
Spain	632
Japan	1,938
USA	814
Italy	100

Top 5 New capacity 2007 (MW)

Germany	1,100
Spain	512
Japan	230
USA	190
Italy	50
Rest	310

EEG

a role model for other countries

- Key points for investment decision are risks in relation to profits
- **Profits**
 - Level and duration of compensation
 - Solar radiation resource
- **Risks**
 - Policy changes
 - Capacity cap of compensation
 - Administrative hurdles
 - Delivery time of components and construction time

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Housing –requirements for PV

- Structural function – Construction
- Aesthetic function – Design
- Energetic function – Power generation
- Requirements:
 - weatherproof, long-life cycle, natural surface, aesthetic, high quality and efficiency, sustainability

Housings as power plants

Flat roof elevated PV plant



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Housings as power plants

Flat roof elevated PV plant



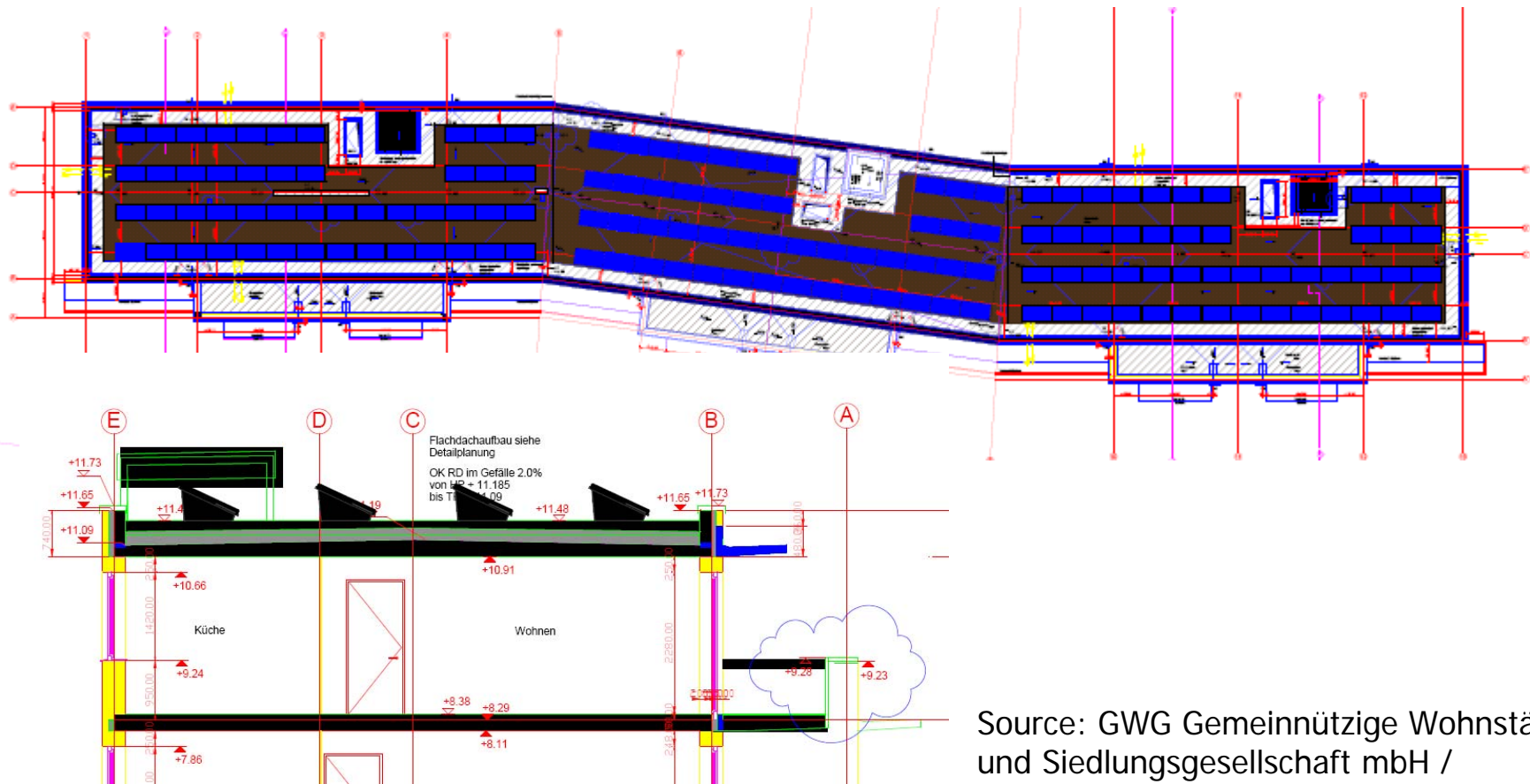
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Housings as power plants

Flat roof elevated PV plant



Source: GWG Gemeinnützige Wohnstätten- und Siedlungsgesellschaft mbH / BEC-Engineering

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Housings as power plants

Building integrated PV plant



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Housings as power plants

Building integrated PV plant



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Housings as power plants

Building integrated PV plant



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Housings as power plants

Building integrated PV plant



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Housings as power plants façade integrated PV plant



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Housings as power plants façade integrated PV plant



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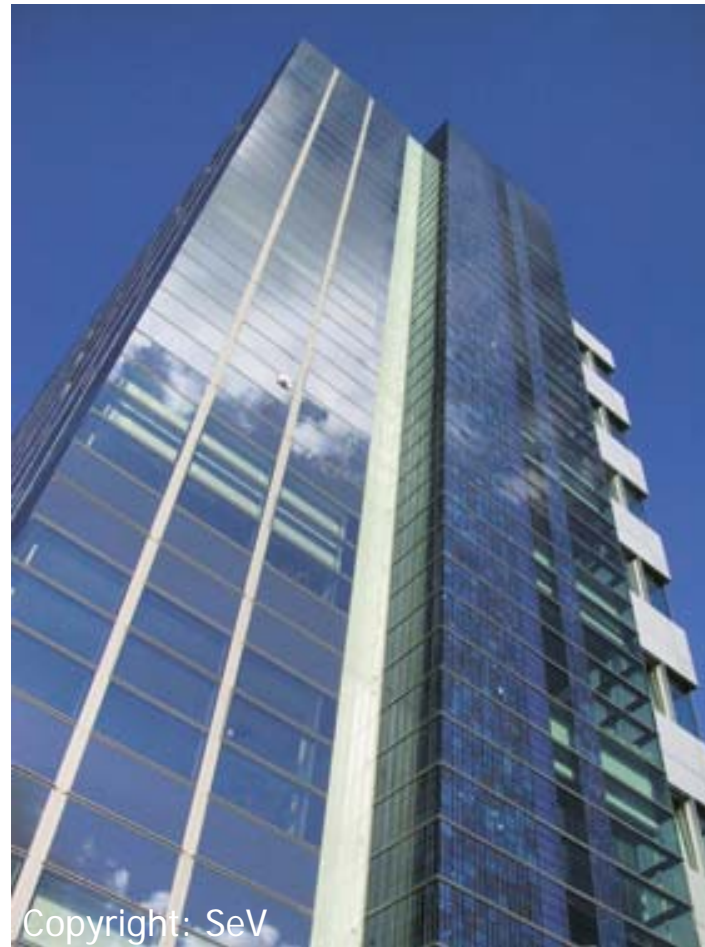
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Housings as power plants façade integrated PV plant



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Housings as power plants façade integrated PV plant



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Housings as power plants

PV plant for shadowing



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Housings as power plants flat roofing system



Quelle: Alwitra

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Summary

- PV is an well engineered and reliable technology with more then 20 years of successfully operation experience
- Photovoltaic will take a key role in the future energy supply
- PV has a big potential for integration on existing and new housings
- Grid parity will be reached for sunny countries within the next few years
- For a continuous grow of PV in new markets political regulations still necessary

Thank you for your attention

Questions?



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