

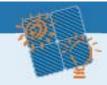
Sustainable PV in Emerging Markets and Developing Regions

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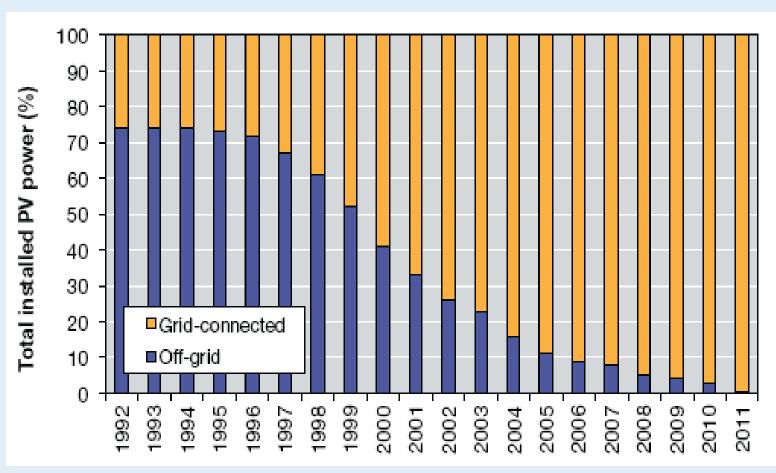






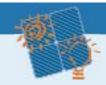


Trend in grid-connected vs. off-grid in PVPS countries

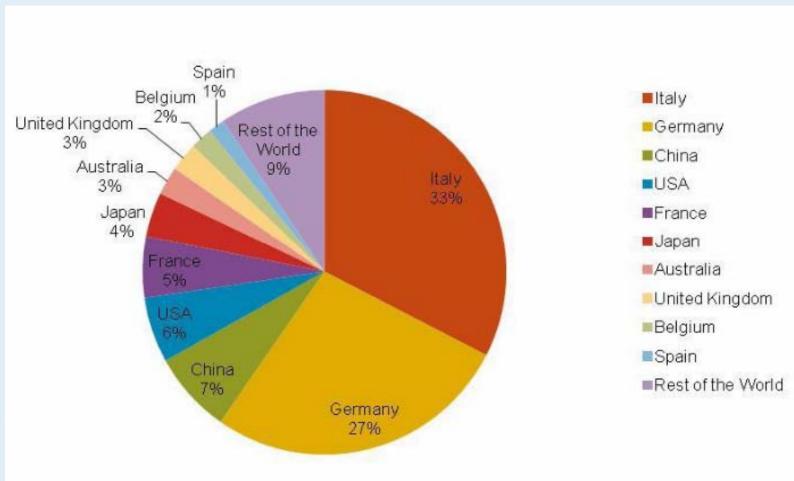




PHOTOVOLTAIC POWER SYSTEMS PROGRAMME



2011 Market Distribution Top 10 ~ 90 % of 27 GW





PV moves from niche markets to



A global market

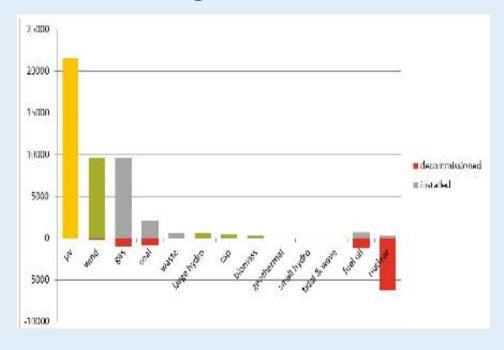


The Context (1/2)

In 2011 RE grew globally 18 % (10 years of double digit growth); oil +1 %, gas +2 %, coal +5 % and nuclear -4 %.

Even if the starting point is low RE is catching up.

Increasing role of RE & PV in recent energy scenarios.

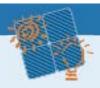


By September 2012 in EU:

~ 100 GW wind

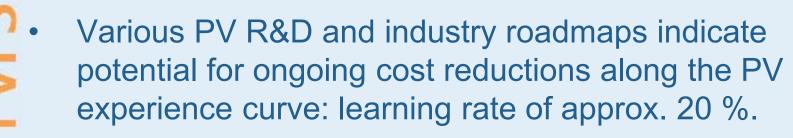
~ 65 GW PV

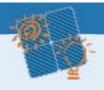




The Context (2/2)

- PV electricity is cheaper then electricity retail prices in an increasing number of countries
- PV electricity is cheaper than from diesel generators in an increasing number of countries
- PV electricity influences dramatically the price of electrici.
- PV module prices: 80 % in only 4 years
- PV system prices: 67 % in only 4 years

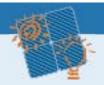




The PV Issues (1/2)

- A main issue will be how to support and underpin a <u>sustainable</u> development of the PV technology and its applications and how to support a <u>sustainable</u> expansion of the global PV market.
- PVPS as an international body of high standing has an important role and important contributions to fulfil.

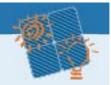




The PV Issues (2/2)

- For governments:
 - Economic crisis in many countries
 - Policy and regulatory framework (grid restructuring)
 - Transition to sustainable markets (instruments)
- For industry:
 - Overcapacity and consolidation interim
 - Fierce competition ongoing
- For society:
 - Perceptions: failure or success, challenge or opportunity





PVPS dimensions of activities

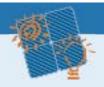










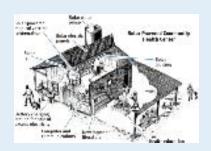


PVPS dimensions of applications













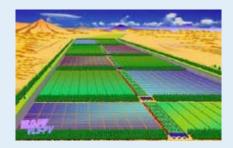


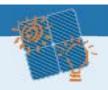








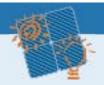




What can PVPS offer emerging markets and developing regions?

- PVPS Task 1 offers information on all dimensions in terms of reports, workshops and special information activities targeting PVPS members.
- PVPS Task 9 offers the same but adapted at and targeting emerging markets and developing regions.
- Task 9 - -





Task 9 Objectives

- Continue research and publications as specific to rural electrification and in particular as related to the Millenium Development Goals
- Investigate the role of PV in urban settings
- Deploy to emerging regions the technical work undertaken by other subtasks and formulate specific research and adaptation as required

 Reach out to focussed emerging markets, working with selected megaphones with a perspective



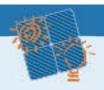


Task 9: Recent Progress (1/2)

Millenium Development Goals related

- PV Water pumping
 - "Policy Recommendations to Improve Sustainability of Rural Water Supply Systems" published in 2012
 - Workshop with RWSN (Rural Water Supply Network)
 - To be presented at Club ER AGM in December 2012
- PV and Health, community services
 - Work starting, publication planned end 2013; updating of extensive previous work
- Pico PV Services
 - Draft document under circulation
 - Position paper to be published before end 2012
 - To be presented at Club ER AGM in December 2012
 - Workshop with ACE in 2013 (+ PV for rural electrification and power plants)





Task 9: Recent Progress (2/2)

Integration of PV in energy systems

- PV in urban settings maybe in collaboration with IRENA
 - Task 9 draft concept paper under development
 - To be discussed with IRENA in December 2012.
- PV in mini-grids
 - Position paper to be published before end of 2012
 - Workshop (-s) January 2013 on design issues
- Collaboration with megaphones
 - Asian Solar Energy Initiative / ADB almost completed
 - African Development Bank / AfDB under development

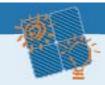




Examples of PVPS efforts

in making PV deployment <u>sustainable</u> in emerging markets and developing regions

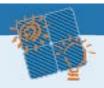
- www.iea-pvps.org (all publications)
- PVPS participation in many arrangements
- Task 1 workshop in Malaysia 2009
- Task 1 workshop in Turkey 2011
- Task 9 contributions to the ASEI/ADB 2010-11
 - Task 9 workshop in Thailand 2007
- Task 9 workshops for donors



The PV market is growing very fast in "new" countries

- PV potential in "sunbelt countries" (+/-35 degr.lat.) ranges from 100 to 300 GW by 2020; at present about 10 %.
- Latin America, Africa, MENA and Asia-Pacific regions publish almost daily new targets and/or installations of PV – increasingly in terms of MW scale plants



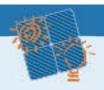


Middle East - examples

- Saudi Arabia targets 15-20 GW of PV by 2032, eventually 100 % RE.
- Iraq targets 40 MW of PV by 2013
- The UAE targets 3 GW by 2025
- Oman targets 400 MW







Africa - examples

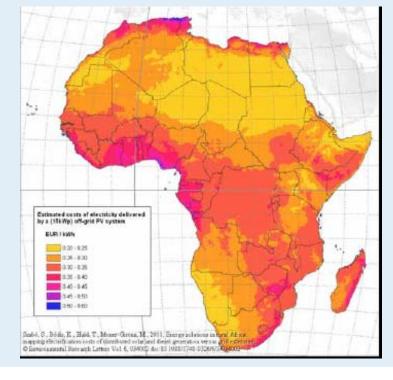
RSA targets ~4,5 GW of RE by 2020, PV ~2 GW

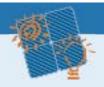
Cape Verde has a PV penetration of about 5,5%

 Investments in RE in Africa are expected to increase by 1.500% from 2011 to 2020 with PV as

a prominent technology







Asia-Pacific - examples

- Asia-Pacific regions installed 6 GW PV in 2011
- Announced project pipe-line is at 20 GW
- China installed around 2,5 GW in 2011 reaching 3,3 GW; 21 GW by 2015 (?)
- India reached a total of almost 600 MW in 2011; 20 GW by 2022





The Role of PVPS in this fast market transformation

- The contribute to a <u>sustainable</u> transformation
 - Policies and strategies
 - Support mechanisms & regulatory frameworks
 - Business models
 - Grid integration (technical & business)
 - Recommended practises what to do and what not to do
 - Targeted stakeholder information



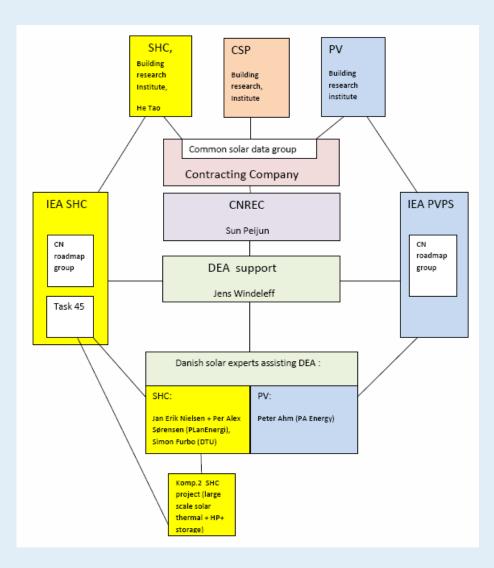
Solar Energy Roadmap for the PRC

- China National Renewable Energy Centre (CNREC) is November 2012 launching a study for the preparation of a Solar Energy Roadmap for China; ready by end of 2013
- The CNREC is supported by the Sino-Danish Renewable Energy Development programme (RED)
- The IEA PVPS is being invited to participate as a forum of hearing – a new role for PVPS if accepted by the Executive Committee

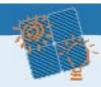


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Envisaged preliminary structure







IEA PVPS

1. IEA PVPS is dedicated to:

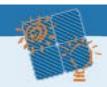
"enhance the international collaboration efforts which accelerate the development and deployment of PV as a significant and sustainable energy option"

2. Task 9 is dedicated to:

"deploying PV services for regional development"



Equation: 1 + 2 = <u>sustainable</u> PV in emerging markets and developing regions



PVPS sustains PV Thank you for your attention





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