Third generation photovoltaics fthenakis

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Fthenakis, Zweibel and Mason (2010) published a study on the feasibility of very-large-scale photovoltaic systems in the southwestern US, and dispersed generation throughout the country.A renewable-energy electricity ...

Some of these methods could increase the PCE past the Shockley-Queisser (SQ) limit of ~33%, making them viable "third generation photovoltaic" (TGPV) cell architectures. Surpassing the SQ limit for single junction solar cells presents both a scientific and a technological challenge, and the use of semiconductor NCs to enhance the ...

i Methodology Guidelines on Life Cycle Assessment of Photovoltaic Electricity: 3rd Edition IEA-PVPS-TASK 12 1 Executive Summary 2 Life Cycle Assessment (LCA) is a structured, comprehensive method of quantifying 3 material and energy flows and their associated emissions caused in the life cycle1 of goods 4 and services. The ISO 14040 and 14044 standards provide ...

2. Overview of photovoltaic technologies. Over the last twenty years, the PV industry showed annual growth rates between 40 % and 80 %, proving its strength and potential to become a major worldwide power generation source (Joint Research Centre [JRC], 2010).The enormous potential of PV is also evident by the fact that the existing global energy demands ...

In general they are referred to as Third or Next Generation photovoltaics (PV) (Green 2003, Luque et al. 2005, Martí and Luque 2004). Nanotechnology is essential in realizing most of these concepts (Soga 2006, Tsakalakos 2008), and semiconductor nanocrystals have been recognized as "building blocks" of nanotechnology for use in next ...

Vasilis Fthenakis is a senior scientist at Brookhaven National Laboratory, a professor and founding director of the Center for Life Cycle Analysis at Columbia University. Dr Fthenakis is recognized worldwide for his research that provided ...

We review recent progress towards increasing solar cell efficiencies beyond the Shockley-Queisser efficiency limit. Four main approaches are highlighted: multi-junction cells, intermediate-band cells, hot carrier cells and spectrum conversion. Multi-junction cells use multiple solar cells that selectively absorb different regions of the solar spectrum. ...

The third generation PV refers to all the innovative non-silicon based solar cells that have been developed to

overcome the dependency on traditional semiconductors for PV electricity generation. ... For this reason, Fthenakis et al. developed the "Methodology Guidelines on Life-Cycle Assessment of Photovoltaic Electricity" within the ...

"Martin A. Green of the University of New South Wales, Sydney, is arguably the most renowned scientist in the field of photovoltaics ... The book is well written, covers all the important concepts, and gives the right references. Green manages to keep the reader"s attention in spite of some arduous derivations ...

Part of the book: Third Generation Photovoltaics. Vasilis Fthenakis is a senior scientist at Brookhaven National Laboratory, a professor and founding director of the Center for Life Cycle Analysis at Columbia University.

In book: Third Generation Photovoltaics; Authors: Annick Anctil. Michigan State University; Vasilis Fthenakis. ... All content in this area was uploaded by Vasilis Fthenakis on Feb 02, 2016 .

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Third generation PV technologies may overcome the fundamental limitations of photon to electron conversion in single-junction devices and, thus, improve both their efficiency and cost. This ...

Photovoltaics have started replacing fossil fuels as major energy generation roadmaps, targeting higher efficiencies and/or lower costs are aggressively pursued to bring PV to cost parity with grid electricity. Third generation PV technologies may overcome the fundamental limitations of photon to electron conversion in single-junction devices and, ...

[13] Anctil A and Fthenakis V 2012 Third Generation Photovoltaics ed V Fthenakis (InTech) Life Cycle Assessment of Organic Photovoltaic 91-110 chapter 4. Google Scholar [14] Gerbiner S, Belboom S and Léonard A 2014 Life Cycle Analysis (LCA) of Photovoltaic Panels: A Review Renewable and Sustainable Energy Review 38 747-753. Crossref; Google ...

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V Fthenakis; Recommended publications. ... emerging fields of third-generation photovoltaic energy converters and artificial photosynthetic systems aimed at the production of solar fuels, creating ...

It is argued, therefore, that photovoltaics is likely to evolve, in its most mature form, to a "third generation" of high-efficiency thin-film technology. By high efficiency, what is meant is energy conversion values double or triple the 15-20% range presently targeted, closer to the thermodynamic limit of 93%.

The key property which makes organic photovoltaics so attractive is the potential of roll-to-roll processing on low cost substrates with standard coating and printing processes. Printing or coating techniques like screen, inkjet, offset, gravure, slot die, spray and others are being established and demonstrated for organic photovoltaic (OPV ...

Martin Green, one of the world"s foremost photovoltaic researchers, argues in this book that "second generation" photovoltaics will eventually reach its own material cost constraints, ...

Publishing Process Manager Anja Filipovic Technical Editor Teodora Smiljanic Cover Designer InTech Design Team First published March, 2012 Printed in Croatia A free online edition of this book is available at Additional hard copies can be obtained from Third Generation Photovoltaics, Edited by Vasilis ...

Third Generation Photovoltaics [Fthenakis, Vasilis] on Amazon . *FREE* shipping on qualifying offers. Third Generation Photovoltaics ... Third Generation Photovoltaics. Skip to main content . Delivering to Lebanon 66952 Update location Books. Select the department you want to search in. Search Amazon. EN. Hello, sign in. Account & Lists ...

Fthenakis V. (editor), Third Generation Photovoltaics, InTech Publishing, 2012. 7 Energy-Environmental Systems Analysis Example: CdTe PV LCA Questions to answer: Low Cost Resource Availability Lowest ... PV, CdTe (Fthenakis et al, 2014) PV, mc-Si, (Fthenakis et al, 2014) GHG (g CO2-eq./kWh) Materials Operation Transportation

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3 Organic PV Cell Structure The highlight of third-generation solar cells in general, and specifically OSC in this case, is the deviation from the conventional P-N junction that is utilized in first generation crystalline silicon and second generation thin-film tech-nologies. With conventional P-N junction structures, the

In particular, the third generation of photovoltaic cells and recent trends in its field, including multi-junction cells and cells with intermediate energy levels in the forbidden band of silicon, are discussed. ... Fthenakis V., Athias C., Blumenthal A., Kulur A., Magliozzo J., Ng D. Sustainability evaluation of CdTe PV: An update. Renew. Sustain.

A Anctil, V Fthenakis. Third Generation Photovoltaics, 2012. 27: 2012: Direct Te Mining: Resource Availability and Impact on Cumulative Energy Demand of CdTe PV Life Cycles. V Fthenakis, A Anctil. IEEE Journal of Photovoltaics 3 (1), 433-438, 2012. 25: 2012: