

CONFERENCE PROGRAMME

THURSDAY, 24 September 2009

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(i) = invited

PLENARY SESSION 3DP.1

08:30 – 10:10 Thin Film Solar Cells

Chairpersons:

F. Karg
Avancis, Torgau, Germany

B. Rech
Helmholtz Centre Berlin for Materials and Energy, Germany

3DP.1.1 C. Ballif, D. Domine, P. Buehlmann, A. Feltrin, M. Python, M. Despeisse, M. Boccard, F. Sculati-Meillaud, G. Bugnon, N. Wyrsh, S. Fay & A. Billet
EPFL, Neuchâtel, Switzerland
Light Trapping and Microcrystalline Si Growth Management for High Efficiency Micromorph Cells

3DP.1.2 T. Brammer
Sontor, Bitterfeld-Wolfen, Germany
Status of the Thin-Film Silicon Tandem Production Line at Sontor

3DP.1.3 invited

3DP.1.4 L. Stolt
Solibro, Bitterfeld-Wolfen, Germany
Global Survey on CIGS Solar Module Production

3DP.1.5 M.J. Keevers, U. Schubert, T.L. Young, R. Egan & M. Wolf
CSG Solar Pty, Sydney, Australia
J. Schneider
CSG Solar, Bitterfeld-Wolfen, Germany
M.A. Green
University of NSW, Sydney, Australia
F. Falk, A. Gawlik & G. Andrä
IPHT, Jena, Germany
CSG Minimodules Using Electron-Beam Evaporated Silicon

VISUAL PRESENTATIONS 2DV.1

08:30 – 10:10 Mono- and Multicrystalline Silicon Materials and Cells

Detailed information on Session 2DV.1 is presented in the section entitled 'Visual Presentations'.

BREAK 10:10 – 10:30

PLENARY SESSION 2DP.2

10:30 – 12:10 Wafer-Based Silicon Solar Cells and Materials Technology (2)

Chairpersons:

F. Ferrazza
Eni, Rome, Italy

R. Swanson (i)
SunPower, Los Altos Hills, United States

2DP.2.1 K. Hesse
Wacker Chemie, Burghausen, Germany
Status and Development of Solar-grade Silicon Feedstock

2DP.2.2 F. Henley, S. Kang, L. Tian, Z. Liu, J. Wang & Y.-L. Chow
Silicon Genesis Corporation, San Jose, United States
Kerf-Free 20-150µm c-Si Wafering for Thin PV Manufacturing

2DP.2.3 R. Preu, D. Biro, J. Rentsch, A. Grohe, M. Hofmann, A. Wolf, L. Gautero, J. F. Nekarda, F. Clement, N. Mingirulli, A. Knorz, M. Alemán, M. Hörteis & S.W. Glunz
Fraunhofer ISE, Freiburg, Germany
Technology Road Map for the Economically Sound Production of 20+% Efficient Passivated Silicon Solar Cells

2DP.2.4 A.W. Weeber, N. Guillevin, R. Naber, D.S. Saynova & L.J. Geerligs
ECN, Petten, The Netherlands
Status of n-Type Solar Cells for Low-Cost Industrial Production

2DP.2.5 W. Kwapil, M. Kasemann & W. Warta
Fraunhofer ISE, Freiburg, Germany
O. Breitenstein, J. Bauer, J.-M. Wagner, H. Blumtritt & A. Lotnyk
Max-Planck-Institut, Halle, Germany
Physical Mechanisms of Breakdown in Multicrystalline Silicon Solar Cells

ORAL PRESENTATIONS 5DO.7

**10:30 – 12:00 Off-Grid Applications and Rural Electrification
PV Technology for Developing Countries**

Chairpersons:

W. Palz
WCRE, Brussels, Belgium

B. Ghosh
University of Jadavpur, Kolkata, India

- 5DO.7.1** P. Avato & A. Cabraal
The World Bank, Washington, DC, United States
G. Bopp, S. Lux & N. Pfanner
Fraunhofer ISE, Freiburg, Germany
R. Grüner & C. Hellpap
GTZ, Eschborn, Germany
K. Reiche
iiDevelopment, Frankfurt, Germany
Investigations and Tests of LED Based PV Powered Lanterns
- 5DO.7.2** O.S. Sastry, G. Prasad, P.C. Pant, R. Kumar & B. Bandyopadhyay
Solar Energy Center, New Delhi, India
Use of PV Based White LED Lighting Systems in India
- 5DO.7.3** N. Subedi & R. Munankami
Alternative Energy Promotion Centre, Lalitpur, Nepal
Lighting the High Himalayan Households with WLED Based PV Lighting Systems: Nepalese Experience
- 5DO.7.4** Y. Thiaux, L. Schmerber, J. Seigneurbieux, B. Multon & H. Ben Ahmed
SATIE CNRS UMR, Bruz, France
Comparison between Lead-Acid and Li-Ion Accumulators in Stand-Alone Photovoltaic System Using the Gross Energy Requirement Criteria
- 5DO.7.5** L. Narvarte & E. Lorenzo
UPM, Madrid, Spain
PV Pumping and Sustainability: a Successful 12-Years Story
- 5DO.7.6** I.M. Saleh Ibrahim
University of Al-Fatah, Tripoli, Libya
I. Abouhdima
General Post and Telecommunication of Libya, Tripoli, Libya
Performance of Thirty Years Stand Alone Photovoltaic System

VISUAL PRESENTATIONS 6DV.2

10:30 – 12:10 Markets for PV Systems

Detailed information on Session 6DV.2 is presented in the section entitled 'Visual Presentations'.

LUNCH 12:10 – 13:00

ORAL PRESENTATIONS 2DO.1

**13:00 – 14:30 Mono- and Multicrystalline Silicon Materials and Cells
Surface Preparation and Heterojunctions**

Chairpersons:

S. Reber
Fraunhofer ISE, Freiburg, Germany

C. del Cañizo
UPM, Madrid, Spain

- 2DO.1.1** J. Rentsch, K. Birmann, H. Furtwängler, J. Haunschild, G. Kästner, R. Neubauer, A. Oltersdorf, S. Rein, A. Schütte, M. Zimmer & R. Preu
Fraunhofer ISE, Freiburg, Germany
Wet Chemical Processing for C-Si Solar Cells - Status and Perspectives
- 2DO.1.2** H. Hauser, A. Guttowski, J. Mick, M. Pfeifer, P. Voisin, M. Hermle, S.W. Glunz & B. Bläsi
Fraunhofer ISE, Freiburg, Germany
C. Müller
University of Freiburg, Germany
Honeycomb Textured Multicrystalline Silicon via Nanoimprint Lithography
- 2DO.1.3** R. Stangl, L. Korte, J. Haschke, T.F. Schulze, E. Conrad, F. Wünsch, M. Kunst, M. Schmidt, K. Lips & B. Rech
Helmholtz Centre Berlin for Materials and Energy, Germany
Amorphous/Crystalline Silicon Heterojunction Solar Cell Concepts at the Helmholtz-Zentrum Berlin
- 2DO.1.4** J.-P. Becker, D. Pysch, A. Leimenstoll, M. Hermle & S.W. Glunz
Fraunhofer ISE, Freiburg, Germany
Wet-Chemical Pre-Treatment of c-Si Substrates Enhancing the Performance of a-Si:H/c-Si Hetero-Junction Solar Cells
- 2DO.1.5** T. Mueller, S. Schwertheim & W.R. Fahrner
University of Hagen, Germany
Heterojunction Solar Cells with a-SiO_x:H Surface Passivation and μ -Si:H Emitter
- 2DO.1.6** J. Irikawa, S. Miyajima, A. Yamada & M. Konagai
Tokyo Institute of Technology, Japan
Optimization of Contact Hole Formation Process by Reactive Ion Etching for 3c-SiC/Si Heterojunction Solar Cells with a-Al_{1-x}O_x:H Rear Surface Passivation Layer

ORAL PRESENTATIONS 3DO.4

13:00 – 14:30 CIS and Other (II-VI) Ternary Thin Film Solar Cells

Advanced CIGS Devices

Chairpersons:

A.N. Tiwari
EMPA, Dübendorf, SwitzerlandD. Hariskos
ZSW, Stuttgart, Germany

3DO.4.1 R. Verma, A. Chirila, J. Perrenoud, D. Guettler, S. Bücheler, S. Seyrling & A.N. Tiwari
EMPA - Swiss Federal Laboratories, Dübendorf, Switzerland
Flexible Cu(In,Ga)Se₂ Solar Cells with In₂S₃ Buffer Layer

3DO.4.2 T. Eisenbarth, T. Unold, C.A. Kaufmann, R. Caballero, T. Rissom & H. W. Schock
Helmholtz Centre Berlin for Materials and Energy, Germany
A. Eicke
ZSW, Stuttgart, Germany
Optimization of CIGS Growth on Stainless Steel with the Resulting Impact on Defect Concentrations and Device Performance

3DO.4.3 T. Nakada, T. Yagioka, K. Horiguchi, J. Hirata, T. Kuraishi & T. Mise
Aoyama Gakuin University, Sagami-hara, Japan
CIGS Thin Film Solar Cells on Flexible Foils

3DO.4.4 A. Ennaoui, R. Saez-Araoz & M. C. Lux-Steiner
Helmholtz Centre Berlin for Materials and Energy, Germany
T.P. Niesen
Avancis, Munich, Germany
A. Neisser
Sulfurcell Solartechnik, Berlin, Germany
CBD-Zn(S,O) Buffer Layers for Cu-Chalcopyrite Solar Modules during "Athlet" Project: Present Status and Recent Developments

3DO.4.5 D. Hariskos, R. Menner, W. Wischmann & M. Powalla
ZSW, Stuttgart, Germany
N. Naghavi, C. Hubert & D. Lincot
CNRS-EDF-ENSCP, Chatou, France
The ZnS/ZnMgO Buffer Combination in CIGS-Based Solar Cells: Up-Scaling to 30×30 cm² Modules

3DO.4.6 N.A. Allsop, S. Gledhill, T. Köhler, M. Krüger, R. Schwieger, M. C. Lux-Steiner & C. H. Fischer
Helmholtz Centre Berlin for Materials and Energy, Germany
J. Eckstein
Stangl Semiconductor Equipment, Eichenau, Germany
Advances in ILGAR In₂S₃ Buffer Layers for Chalcopyrite Solar Cells

ORAL PRESENTATIONS 5DO.8

13:00 – 14:30 Off-grid Applications and Rural Electrification

Europe – Developing Countries Cooperation

Chairpersons:

B. McNelis
IT Power, Hampshire, UKA.K. Barua (i)
Indian Association for the Cultivation of Science, Kolkata, India

5DO.8.1 M. Solano-Peralta & W.G.J.H.M. van Sark
University of Utrecht, The Netherlands
M. Moner-Girona
European Commission DG JRC, Ispra, Italy
X. Vallve
Trama TecnoAmbiental, Barcelona, Spain
"Tropicalisation" of Feed-in Tariffs: Nourishing Off-Grid PV/Diesel Hybrid Systems with a Renewable Energy Premium Tariff

5DO.8.2 M.A. Egado-Aguilera & M. Camino-Villacorta
UPM, Madrid, Spain
I. Salazar
DEUMAN, Lima, Peru
Implementation of Quality Assurance Procedures in Rural Electrification with PV Systems

5DO.8.3 B. Ortiz
Fraunhofer ISE, Freiburg, Germany
M. A. Egado-Aguilera
UPM, Madrid, Spain
P. Arranz
TTA, Barcelona, Spain
P. Jacquin
PHK Consultants, Leon, France
Support and Development of Local Electricity Service Providers in Ecuador and Peru

5DO.8.4 M. Cendagorta, J. Rodríguez & L. López-Manzanares
ITER, Santa Cruz de Tenerife, Spain
Euro-Solar Programme. Renewable Energy Kits to Fight Poverty

5DO.8.5 G. Papadakis, E.S. Mohamed & G. Kyriakarakos
Agricultural University of Athens, Greece
A.-W.S. Kassem
University of Alexandria, Egypt
Hybrid Renewable Energy Systems for the Supply of Services in Rural Settlements of Mediterranean Partner Countries. The HYRESS Project – The Case Study of the Hybrid System in Egypt

- 5DO.8.6** A. Graillot & X. Vallve
 Trama TecnoAmbiental, Barcelona, Spain
 S. Pouffary
 ADEME, Valbonne, France
 N. Adra
 Transénergie, Ecully, France
 C. Abisaid
 LSES, Beirut, Lebanon
 G. Bopp
 Fraunhofer ISE, Freiburg, Germany
 K. Daoud
 NERC, Amman, Jordan
 M. Enzli
 CDER, Marrakech, Morocco
 A. Hamidat
 CDER, Algier, Algeria
 D. Mayer
 ARMINES, Paris, France
 S. Quaranta
 Sasso, Cuneo, Italy
**Cost Efficient and Reliable Rural Electrification Schemes for South
 Mediterranean Countries Based on Multi User Solar Hybrid Micro-Grids
 (CRESMED)**

VISUAL PRESENTATIONS 6DV.3

13:00 – 14:30 Enablers for PV Development and Benefits of PV

Detailed information on Session 6DV.3 is presented in the section entitled 'Visual Presentations'.

BREAK 14:30 – 14:45

ORAL PRESENTATIONS 2DO.2

14:45 – 16:15 Mono- and Multicrystalline Silicon Materials and Cells

Novel Materials and Advanced Processing

Chairpersons:

S.W. Glunz
 Fraunhofer ISE, Freiburg, Germany
 E. Sauar
 REC Solar, Sandvika, Norway

- 2DO.2.1** J. Junge, A. Herguth, S. Seren & G. Hahn
 University of Konstanz, Germany
Reducing the Impact of Metal Impurities in Block-Cast Multicrystalline Silicon
- 2DO.2.2** P. Bronsveld, R. Naber & L.J. Geerligs
 ECN, Petten, The Netherlands
 S. Pozigun
 JSC Pillar, Kiev, Ukraine
 M. Syvertsen
 SINTEF, Trondheim, Norway
 C. Knopf
 Deutsche Solar, Freiburg, Germany
 R. Kvande
 FesilSunergy, Lilleby, Norway
**p- and n-Type Mono- and Multicrystalline-Si Solar Cells Using Blended
 Upgraded Metallurgical Grade Silicon**
- 2DO.2.3** S. Rein, W. Kwapil, J. Geilker, G. Emanuel, M. Spitz, I. Reis, A. Weil & D. Biro
 Fraunhofer ISE, Freiburg, Germany
 A.K. Soiland, E. Enebakk & R. Tronstad
 Elkem Solar, Kristiansand, Norway
Impact of Compensated SoG Si on Cz Silicon Wafers and Solar Cells
- 2DO.2.4** P. Manshanden, P. Bronsveld & L.J. Geerligs
 ECN, Petten, The Netherlands
**15.4% Efficient p-Type Multicrystalline Silicon Cells Containing 20
 PPMA Interstitial Oxygen**
- 2DO.2.5** L. Gautero, M. Hofmann, J. Rentsch, A. Lemke, S. Mack, J. Seiffe, J. F. Nekarda, D. Erath, D. Biro & R. Preu
 Fraunhofer ISE, Freiburg, Germany
 B. Bitnar
 SolarWorld Innovations, Freiburg, Germany
 J.-M. Sallese
 EPFL, Lausanne, Switzerland
**All-Screen-Printed 120- μ m-Thin Large-Area Silicon Solar Cells Applying
 Dielectric Rear Passivation and Laser-Fired Contacts Reaching 18%
 Efficiency**
- 2DO.2.6** K. Baert, G. Beaucarne, F. Dross, I. Gordon, J. John, N.E. Posthuma, J. Van Hoeymissen, E. Van Kerschaver & J. Poortmans
 IMEC, Leuven, Belgium
**Crystalline Si Solar Cells: Applying the Experience from
 Microelectronics to Improve Efficiency and Reduce Cost**

ORAL PRESENTATIONS 3DO.5

14:45 – 16:15 CIS and Other (II-VI) Ternary Thin Film Solar Cells

Modelling and Characterisation for Multinary Thin Film Solar Cells

Chairpersons:

H.-W. Schock
Helmholtz Centre Berlin for Materials and Energy, Germany
N.N.

- 3DO.5.1** M. Nerat, G. Cernivec, F. Smole & M. Topic
University of Ljubljana, Slovenia
One- and Two-Dimensional Analysis of CIGSS Solar Cells Using an Advanced Solar Cell Simulator ASPIN
- 3DO.5.2** P. Mack & T. Walter
Ulm University of Applied Sciences, Germany
D. Hariskos
ZSW, Stuttgart, Germany
R. Schäßler & B. Dimmler
Würth Solar, Schwäbisch Hall, Germany
Endurance Testing and Accelerated Ageing of CIGS Thin Film Solar Cells
- 3DO.5.3** M. Bär, M. Rusu, S. Lehmann, T. Schedel-Niedrig, I. Lauermann & M. C. Lux-Steiner
Helmholtz Centre Berlin for Materials and Energy, Germany
CuGaSe₂ Thin-Film Solar Cell Absorbers: Chemical and Electronic Surface and Interface Structure Revealed by Photoelectron Spectroscopy
- 3DO.5.4** J. Windeln & C. Ludwig
IBM Deutschland, Mainz, Germany
C. Felser & T. Schilling
University of Mainz, Germany
H. W. Schock, R. Klenk & D. Kieven
Helmholtz Centre Berlin for Materials and Energy, Germany
W. Mannstadt, E. Rudigier-Voigt & B. Speit
SCHOTT, Mainz, Germany
H. Metzner
Friedrich-Schiller University of Jena, Germany
comCIGS - Integrative Framework of Experimental and Virtual Lab
- 3DO.5.5** A. Helbig & J.H. Werner
University of Stuttgart, Germany
T. Kirchartz & U. Rau
Forschungszentrum Jülich, Germany
R. Schäßler
Würth Solar, Schwäbisch Hall, Germany
Electroluminescence Analysis of Cu(In,Ga)Se₂ Thin Film Modules
- 3DO.5.6** B.A. Schubert, B. Marsen, T. Unold & H.-W. Schock
Helmholtz Centre Berlin for Materials and Energy, Germany
Preparation of Cu₂ZnSnS₄ (CZTS) Solar Cells by Sequential and Simultaneous Co-Evaporation

ORAL PRESENTATIONS 6DO.9

14:45 – 16:15 Markets for PV Systems

From RTD and Implementation Issues to Worldwide PV Markets

Chairpersons:

E. Despotou
EPIA, Brussels, Belgium
N.N.

- 6DO.9.1** P. Menna, R. Gambi & A. Hercsuth
European Commission DG TREN, Brussels, Belgium
W. Gillett & G. Tondi
European Commission EACI, Brussels, Belgium
A. Piontek
European Commission DG RTD, Brussels, Belgium
European Photovoltaic RTD and Demonstration Programme
- 6DO.9.2** M. Krupp & H. Bastek
Forschungszentrum Jülich, Germany
O. Bernsen
SenterNovem, The Hague, The Netherlands
A. Clavierie
ADEME, Sophia Antipolis, France
A. Dahlen
MWME, Düsseldorf, Germany
K. D'Hondt
EWI, Brussels, Belgium
H. Fechner
Arsenal Research, Vienna, Austria
M. Gutschner & S. Nowak
NET Nowak Energy&Technology, St. Ursen, Switzerland
M. Hübner
Forschungsförderungsgesellschaft, Vienna, Austria
A. Lancha
MICINN, Madrid, Spain
S. Oberholzer
Swiss Federal Office of Energy, Bern, Switzerland
A. Ostapczuk
National Centre for Research and Development, Warsaw, Poland
L. Palmblad
Swedish Energy Agency, Eskilstuna, Sweden
S.M. Pietruszko
University of Technology Warsaw, Poland
PV-ERA-NET – Towards more Joint Activities in Transnational European PV RTD Programming
- 6DO.9.3** C. Lins
EREC, Brussels, Belgium
National Implementation of the RES Directive & the Role of PV in Europe's Renewable Energy Mix by 2020
- 6DO.9.4** invited

Thursday, 24 September 2009

6DO.9.5 O. Ikki, I. Kaizuka, T. Ohigashi & H. Matsukawa
RTS Corporation, Tokyo, Japan
PV Market of Japan, Rising Again with the New Support Framework

6DO.9.6 T. Grigoleit
Germany Trade and Invest, Berlin, Germany
Status of the PV Market and Industry in Germany

VISUAL PRESENTATIONS 1DV.4

14:45 – 16:15 Organic-based PV

Detailed information on Session 1DV.4 is presented in the section entitled 'Visual Presentations'.

BREAK 16:15 – 16:30

ORAL PRESENTATIONS 2DO.3

**16:30 – 18:00 Mono- and Multicrystalline Silicon Materials and Cells
Industrial Type Solar Cells**

Chairpersons:

P. Malbranche
CEA, Le Bourget du Lac, France
N.N.

2DO.3.1 J. John, G. Beaucarne, P. Choulal & Y. Ma
IMEC, Leuven, Belgium
R. Russell
BP Solar, Madrid, Spain
I. Romijn & A.W. Weeber
ECN, Petten, The Netherlands
M. Hofmann, R. Preu & L. Gautero
Fraunhofer ISE, Freiburg, Germany
A. Slaoui
InESS, Strasbourg, France
N. Le Quang & O. Nichiporuk
Photowatt, Bourgoin Jallieu, France
C. del Cañizo & A. Pan
UPM, Madrid, Spain
H.J. Solheim & J. Evju
Rec ScanCell, Narvik, Norway
H. Nagel
SCHOTT Solar, Alzenau, Germany
B. Bitnar, M. Heemeier & T. Weber
SolarWorld, Bonn, Germany
M. Kaes, B. Raabe, H. Haverkamp, C. Strümpel & G. Hahn
University of Konstanz, Germany
A Review on 5 Years Cell Development within the European Integrated Project Crystal Clear

Thursday, 24 September 2009

2DO.3.2 H. Neuhaus
Solarworld Innovations, Freiberg, Germany
F. Bamberg
Deutsche Cell, Freiberg, Germany
D.K. Fork, A. Kalio, M. Prondzinski, D. Duff, A.R. Lewis, R.B. Rao & S.E. Solberg
PARC, Palo Alto, United States
M. Merscher, F. Polak, L. Redmann & C. Uriarte
Jonas & Redmann, Berlin, Germany
High Throughput Production of Silicon Solar Cells with High Aspect Ratio Grid Lines Using Extrusion Printing

2DO.3.3 C. Schmiga, M. Hörteis, M. Hermle & S.W. Glunz
Fraunhofer ISE, Freiburg, Germany
K. Meyer, J. Lossen & H. J. Krokoszinski
ersol Solar Energy, Erfurt, Germany
Large-Area n-Type Silicon Solar Cells with Printed Contacts and Aluminium-Alloyed Rear Emitter

2DO.3.4 V. Prajapati, E. Cornagliotti, P. Choulal, J. John & G. Beaucarne
IMEC, Leuven, Belgium
R. Russell & J. M. Fernandez
BP Solar, Madrid, Spain
R.F. Clark & N. Stoddard
BP Solar, Frederick, United States
High Efficiency Industrial Silicon Solar Cells on Silicon Mono 2TM Casted Material Using Dielectric Passivation and Local BSF

2DO.3.5 R. Ozaki, H. Yashiki, R. Imai, S. Ooka, Y. Kurimoto, I. Yamasaki, Y. Yamamoto & T. Saga
SHARP Corporation, Nara, Japan
Fabrication of SiN Rear Passivated Thin Multi-Crystalline Silicon Solar Cell with 30µm-Wide Screen-Printed Front Electrode

2DO.3.6 T. van Amstel & I.J. Bennett
ECN, Petten, The Netherlands
V.A. Popovich
Delft University of Technology, The Netherlands
A Multiscale Model of the Aluminium Layer at the Rear Side of a Solar Cell

ORAL PRESENTATIONS 3DO.6

**16:30 – 18:00 CIS and Other (II-VI) Ternary Thin Film Solar Cells
Industrial Approach for CIGS Manufacturing**

Chairpersons:

P. Mogensen
Avancis, Torgau, Germany
B. Dimmler
Würth Solar, Schwäbisch Hall, Germany

3DO.6.1 I. Kötschau, A. Kampmann, T. Hahn, J. Hinz & D. Schmid
centrotherm photovoltaics, Blaubeuren, Germany
A New Reactive Annealing Approach for Large Scale Cu(In,Ga)Se₂ Mass Production

- 3DO.6.2** V. Probst, F. Hergert, B. Walther, R. Thyen & G. Batereau-Neumann
Johanna Solar Technology, Brandenburg a.d. Havel, Germany
High Performance CIS Solar Modules: Status of Production and Development at Johanna Solar Technology
- 3DO.6.3** A. Neisser, A. Meeder, F. Zetsche, U. Rühle, C. von Klopmann & N. Meyer
Sulfurcell Solartechnik, Berlin, Germany
Manufacturing of Large-Area CuInS₂ Solar Modules – From Pilot to Mass Production
- 3DO.6.4** H. Sugimoto, T. Aramoto, Y. Kawaguchi, Y. Chiba, S. Kijima, Y. Fujiwara, Y. Tanaka, H. Hakuma, K. Kakegawa & K. Kushiya
Showa Shell Sekiyu K. K., Atsugi, Japan
Impact of Cu(InGa)(SeS)₂ Absorber Quality and Circuit Uniformity on Improved Efficiency; Application of Photoluminescence and Electroluminescence Techniques
- 3DO.6.5** J. Patrin & R. Bresnahan
Veeco Instruments, St. Paul, United States
T. Lampros
Veeco Solar Equipment, Lowell, United States
Development of Thin Film Systems for CIGS on Glass and Flexible Substrates at Veeco Instruments Using Linear Evaporation Sources
- 3DO.6.6** M. Schlott, C. Simons & A. Kastner
W.C. Heraeus, Hanau, Germany
Sputtering Targets and Thin Film Properties for Thin Film Photovoltaic Cells

ORAL PRESENTATIONS 6DO.10

**16:30 – 18:00 Enablers for PV Development and Benefits of PV
Cost Trends and Benefits of PV**

Chairpersons:

W.G.J.H.M. Van Sark
University of Utrecht, The Netherlands

J. Alonso
Isoton, Madrid, Spain

- 6DO.10.1** W. Hoffmann, S. Wieder & T. Pellkofer
Applied Materials, Alzenau, Germany
Differentiated Price Experience Curves as Evaluation Tool for Judging the Further Development of c-Si and Thin Film PV Solar Electricity Products
- 6DO.10.2** S. Szabo & A. Jäger-Waldau
European Commission DG JRC, Ispra, Italy
The Risk Adjusted Financial Costs of PV
- 6DO.10.3** E.L. Chang & D. Lee
Willkie Farr & Gallagher LLP, New York, United States
Trends in PV Patents: The Coming Collision of Patents with Progress in PV Technology

- 6DO.10.4** invited
- 6DO.10.5** V.M. Fthenakis
Brookhaven National Laboratory, Upton, United States
M. De Wild-Scholten
ECN, Petten, The Netherlands
M. Raugei
ESCI, Barcelona, Spain
M. Held
University of Stuttgart, Leinfelden-Echterdingen, Germany
Update of Environmental Impacts and Energy Payback Times of Photovoltaics
- 6DO.10.6** J. Clyncke & V. Gomez
PV Cycle, Brussels, Belgium
B. Konrad, S. Schlenker & K. Wambach
Sunicon, Freiberg, Germany
PVCYCLE - The Voluntary Take Back System and Industrial Recycling of PV Modules

VISUAL PRESENTATIONS 1DV.5

16:30 – 18:00 Solar Cells, Modules and PV Systems for Space Applications

Terrestrial Concentrator Systems

Detailed information on Session 1DV.5 is presented in the section entitled 'Visual Presentations'.