

HORIZON
2020

Concentrating Photovoltaic modules using advanced technologies and cells for highest efficiencies

Results

Project Information

CPVMatch

Grant agreement ID: 640873

[Project website](#) 

DOI

[10.3030/640873](https://doi.org/10.3030/640873) 

Project closed

EC signature date

9 April 2015

Start date

1 May 2015

End date

31 October 2018

Funded under

SOCIETAL CHALLENGES - Secure, clean and efficient energy

Total cost

€ 4 949 596,25

EU contribution

€ 4 949 596,25

Coordinated by

FRAUNHOFER GESELLSCHAFT
ZUR FORDERUNG DER
ANGEWANDTEN FORSCHUNG
EV



Germany

This project is featured in...



29 July 2019



CORDIS provides links to public deliverables and publications of HORIZON projects.

Links to deliverables and publications from FP7 projects, as well as links to some specific result types such as dataset and software, are dynamically retrieved from [OpenAIRE](#)

Deliverables

Websites, patent fillings, videos etc. (1)

[Project Website is online](#)

The project website with at least a presentation of the project and the consortium will be published on the internet

Documents, reports (2)

[Overview article on CPV and CPVMatch](#)

One overview article on CPV and the project in respective magazines for the general public like EU Projects Magazine submitted

[LCA and LCC – report](#)

A data collection focused on cost data and on environmental hotspots. A final report that will summarize the results and interpretations of Life Cycle Assessment and Life Cycle cost studies of mirror-based HCPV modules and Fresnel-lens-based HCPV modules.

Publications

Peer reviewed articles (10)

[Component cell-based restriction of spectral conditions and the impact on CPV module power rating](#)



Author(s): Marc Steiner, Matt Muller, Gerald Siefer, Andreas W. Bett

Published in: Progress in Photovoltaics: Research and Applications, 2018, Page(s) 1-8, ISSN 1062-7995

Publisher: John Wiley & Sons Inc.

DOI: 10.1002/pip.2991

[Four-Junction Wafer-Bonded Concentrator Solar Cells](#)



Author(s): Frank Dimroth, Thomas N. D. Tibbits, Markus Niemeyer, Felix Predan, Paul Beutel, Christian Karcher, Eduard Oliva, Gerald Siefer, David Lackner, Peter Fus-Kailuweit, Andreas W. Bett, Rainer Krause, Charlotte Drazek, Eric Guiot, Jocelyne Wasselin, Aurelie Tauzin, Thomas Signamarcheix

Published in: IEEE Journal of Photovoltaics, Issue 6/1, 2016, Page(s) 343-349, ISSN 2156-3381

Publisher: IEEE Electron Devices Society

DOI: 10.1109/jphotov.2015.2501729

[A Tool to Characterize the Electrical Influence of the Thermal and Mechanical Behaviors of Materials of Optics for CPV applications](#)



Author(s): Arnaud Ritou, Olivier Raccurt, Philippe Voarino, Pierre Besson, Mathieu Baudrit

Published in: MRS Advances, Issue 2/53, 2017, Page(s) 3123-3128, ISSN 2059-8521

Publisher: Cambridge University Press

DOI: 10.1557/adv.2017.463

[Extracting Nonradiative Parameters in III-V Semiconductors Using Double Heterostructures on Active p-n Junctions](#)



Author(s): Alexandre W. Walker, Jonas Schon, Frank Dimroth

Published in: IEEE Journal of Photovoltaics, Issue 8/2, 2018, Page(s) 633-639, ISSN 2156-3381

Publisher: IEEE Electron Devices Society

DOI: 10.1109/JPHOTOV.2017.2777667

[Spectral Impact on Multijunction Solar Cells Obtained by Means of Component Cells of a Different Technology](#)



Author(s): Ruben Nunez, Marta Victoria, Stephen Askins, Ignacio Anton, Cesar Dominguez, Rebeca Herrero, Gabriel Sala

Published in: IEEE Journal of Photovoltaics, Issue 8/2, 2018, Page(s) 646-653, ISSN 2156-3381

Publisher: IEEE Electron Devices Society

DOI: 10.1109/JPHOTOV.2017.2782561

[Spectrally-resolved measurement of concentrated light distributions for Fresnel lens concentrators](#)

Author(s): P. Besson, P. McVey White, C. Dominguez, P. Voarino, P. Garcia-Linares, M. Lemiti, H. Schriemer, K. Hinzer, M. Baudrit

Published in: Optics Express, Issue 24/2, 2016, Page(s) A397, ISSN 1094-4087

Publisher: Optical Society of America

DOI: 10.1364/OE.24.00A397

[Indoor Experimental Assessment of the Efficiency and Irradiance Spot of the Achromatic Doublet on Glass \(ADG\) Fresnel Lens for Concentrating Photovoltaics](#)

Author(s): Guido Vallerotto, Marta Victoria, Stephen Askins, Ignacio Antón, Gabriel Sala, Rebeca Herrero, César Domínguez

Published in: Journal of Visualized Experiments, Issue 128, 2017, Page(s) 1-9, ISSN 1940-087X

Publisher: MYJoVE Corporation

DOI: 10.3791/56269

[Design and modeling of a cost-effective achromatic Fresnel lens for concentrating photovoltaics](#)

Author(s): Guido Vallerotto, Marta Victoria, Stephen Askins, Rebeca Herrero, César Domínguez, Ignacio Antón, Gabriel Sala

Published in: Optics Express, Issue 24/18, 2016, Page(s) A1245, ISSN 1094-4087

Publisher: Optical Society of America

DOI: 10.1364/OE.24.0A1245

[Broadband antireflective coating stack based on mesoporous silica by acid-catalyzed sol-gel method for concentrated photovoltaic application](#)

Author(s): Cecilia Agustín-Sáenz, José Ángel Sánchez-García, Maider Machado, Marta Brizuela, Oihana Zubillaga, Agnieszka Tercjak

Published in: Solar Energy Materials and Solar Cells, Issue 186, 2018, Page(s) 154-164, ISSN 0927-0248

Publisher: Elsevier BV

DOI: 10.1016/j.solmat.2018.06.040

[Minority carrier diffusion length, lifetime and mobility in p-type GaAs and GaInAs](#)

Author(s): M. Niemeyer, J. Ohlmann, A. W. Walker, P. Kleinschmidt, R. Lang, T. Hannappel, F. Dimroth, D. Lackner

Published in: Journal of Applied Physics, Issue 122/11, 2017, Page(s) 115702, ISSN 0021-8979

Publisher: American Institute of Physics

DOI: 10.1063/1.5002630

Conference proceedings (24)

[CPVMatch - Concentrating photovoltaic modules using advanced technologies and cells for highest efficiencies](#) 

Author(s): Simon P. Philipps, Mathieu Baudrit, Karla Hillerich, Valentine Moreau, Rolando Parmesani, Eduardo Román, Gabriel Sala, Bernd Schineller, Gianluca Timò, Andreas W. Bett

Published in: AIP Conference Proceedings volume 1766, Issue 1766, 2016, Page(s) 060002, ISBN 978-0-7354-1424-2

Publisher: AIP Publishing

DOI: 10.1063/1.4962092

[Characterization of the influence of temperature on achromatic mirrors by means of METHOD](#) 

Author(s): Philippe Voarino, Arnaud Ritou, Clément Weick, Pablo Garcia-Linares, Pierre Besson, Mathieu Baudrit

Published in: AIP Conference Proceedings volume 1766, Issue 1766, 2016, Page(s) 050008, ISBN 978-0-7354-1424-2

Publisher: AIP Publishing

DOI: 10.1063/1.4962090

[Rating of CPV modules: Results of module round robins](#) 

Author(s): Marc Steiner, Gerald Siefer, Mathieu Baudrit, Stephen Askins, César Domínguez, Ignacio Antón, Francesco Roca, Raffaele Fucci, Carmine Cancro, Antonio Romano, Giorgio Graditi, Paola Maria Pugliatti, Agnese Di Stefano, Robert Kenny, Matthew Norton, Alessandro Minuto, Paolo Morabito, Matthew Muller, Daniel Riley, Larry Pratt

Published in: AIP Conference Proceedings volume 1766, Issue 1766, 2016, Page(s) 040005, ISBN 978-0-7354-1424-2

Publisher: AIP Publishing

DOI: 10.1063/1.4962082

[A novel achromatic Fresnel lens for high concentrating photovoltaic systems](#) 

Author(s): Guido Vallerotto, Stephen Askins, Marta Victoria, Ignacio Antón, Gabriel Sala

Published in: AIP Conference Proceedings volume 1766, Issue 1766, 2016, Page(s) 050007, ISBN 978-0-7354-1424-2

Publisher: AIP Publishing

DOI: 10.1063/1.4962089

[Measuring primary lens efficiency: A proposal for standardization](#)

Author(s): Marta Victoria, Stephen Askins, Rebeca Herrero, César Domínguez, Rubén Nuñez, Ignacio Antón, Gabriel Sala

Published in: AIP Conference Proceedings volume 1766, Issue 1766, 2016, Page(s) 120001, ISBN 978-0-7354-1424-2

Publisher: AIP Publishing

DOI: 10.1063/1.4962123

[Hybrid dome with total internal reflector as a secondary optical element for CPV](#)

Author(s): Stephen Askins, Marta Victoria, Rebeca Herrero, César Domínguez, Ignacio Antón, Gabriel Sala

Published in: AIP Conference Proceedings volume 1766, Issue 1766, 2016, Page(s) 050002, ISBN 978-0-7354-1424-2

Publisher: AIP Publishing

DOI: 10.1063/1.4962084

[Power rating based on two different spectroheliometers with lattice-matched \(LM\) and upright metamorphic \(UMM\) component solar cells](#)

Author(s): César Domínguez, Rebeca Herrero, Rubén Núñez, Ignacio Antón, Gabriel Sala, Emilio Agudo

Published in: AIP Conference Proceedings volume 1766, Issue 1766, 2016, Page(s) 100002, ISBN 978-0-7354-1424-2

Publisher: AIP Publishing

DOI: 10.1063/1.4962117

[Uncertainty estimation of spectral matching ratio based power rating of CPV modules](#)

Author(s): Marc Steiner, Gerald Siefer, Andreas W. Bett

Published in: AIP Conference Proceedings volume 1881, Issue 1881, 2017, Page(s) 060001, ISBN 978-0-7354-1561-4

Publisher: AIP Publishing

DOI: 10.1063/1.5001433

[Spectrally-resolved optical efficiency using a multi-junction cell as light sensor: Application cases](#)

Author(s): Marta Victoria, César Domínguez, Norman Jost, Guido Vallerotto, Ignacio Antón, Gabriel Sala

Published in: AIP Conference Proceedings volume 1881, Issue 1881, 2017, Page(s) 030011, ISBN 978-0-7354-1561-4

Publisher: AIP Publishing

DOI: 10.1063/1.5001422

[CPVMatch - Concentrating Photovoltaic modules using advanced technologies and cells for highest efficiencies](#)

Author(s): S.P. Philipps, M. Baudrit, K. Hillerich, V. Moreau, R. Parmesani, E. Román Medina, G. Sala, B. Schineller, G. Timò, A.W. Bett

Published in: Proceedings of the 32nd European Photovoltaic Solar Energy Conference and Exhibition, 20-24 June 2016, Munich, Germany, Issue 2016, 2016, Page(s) 1393 - 1398, ISBN 3-936338-41-8

Publisher: WIP Renewable Energies

DOI: 10.4229/EUPVSEC20162016-4CV.1.4

[Using a multi-junction cell receiver as self-detector for spectrally-resolved optical efficiency measurement of concentrators](#) 

Author(s): Cesar Dominguez, Marta Victoria, Valentin Perez, Steve Askins, Rebeca Herrero, Ignacio Anton, Gabriel Sala

Published in: 2016 IEEE 43rd Photovoltaic Specialists Conference (PVSC), 2016, Page(s) 2333-2336, ISBN 978-1-5090-2724-8

Publisher: IEEE

DOI: 10.1109/PVSC.2016.7750055

[Design and analysis of performance of a DC power optimizer for HCPV systems within CPVMatch project](#) 

Author(s): Ricardo Alonso, Ainhoa Pereda, Eneko Bilbao, Jose Antonio Cortajarena, Iñigo Vidaurrezaga, Eduardo Román

Published in: AIP Conference Proceedings volume 2012, Issue 050001 (2018), 2018, Page(s) 050001

Publisher: Author(s)

DOI: 10.1063/1.5053522

[Improvements in the manufacturing process of achromatic doublet on glass \(ADG\) Fresnel lens](#) 

Author(s): Guido Vallerotto, Marta Victoria, Stephen Askins, Ignacio Antón, Gabriel Sala

Published in: AIP Conference Proceedings volume 2012, Issue 2018, 2018, Page(s) 030009

Publisher: Author(s)

DOI: 10.1063/1.5053508

[Impact of the temperature dependence of CPV optics transmittance on the current mismatch of multi-junction solar cells](#) 

Author(s): Norman Jost, Rubén Núñez, Marta Victoria, César Domínguez, Ignacio Antón, Stephen Askins

Published in: AIP Conference Proceedings volume 2012, Issue 2018, 2018, Page(s) 080006

Publisher: Author(s)

DOI: 10.1063/1.5053534

[From component to multi-junction solar cells for spectral monitoring](#) 

Author(s): Norman Jost, Ignacio Antón, Rubén Nuñez, Stephen Askins, Luis J. San José, Guido Vallerotto, Rebeca Herrero, Marta Victoria, César Domínguez,

Gabriel Sala

Published in: AIP Conference Proceedings volume 2012, Issue 2018, 2018,
Page(s) 100002

Publisher: Author(s)

DOI: 10.1063/1.5053546

[MOVPE SiGeSn development for the next generation four junction solar cells](#)

Author(s): Gianluca Timò, Giovanni Abagnale, Nicola Armani, Marco Calicchio,
Bernd Schineller

Published in: AIP Conference Proceedings volume 2012, Issue 2018, 2018,
Page(s) 040011

Publisher: Author(s)

DOI: 10.1063/1.5053519

[A manufacturable achromatic fresnel lens for CPV](#)

Author(s): Stephen Askins, Guido Vallerotto, Marta Victoria, Rebeca Herrero,
Cesar Dominguez, Ignacio Anton, Gabriel Sala

Published in: 2016 IEEE 43rd Photovoltaic Specialists Conference (PVSC),
2016, Page(s) 0204-0209, ISBN 978-1-5090-2724-8

Publisher: IEEE

DOI: 10.1109/PVSC.2016.7749579

[Optical design of an off-axis mirror based solar concentrator](#)

Author(s): Franco Trespidi, Gianluca Timò

Published in: AIP Conference Proceedings volume 1881, Issue 1881, 2017,
Page(s) 030008, ISBN 978-0-7354-1561-4

Publisher: AIP Publishing

DOI: 10.1063/1.5001419

[Optical modelling based on angle and temperature dependent EQE measurements on III-V multi-junction solar cells](#)

Author(s): Sarah Bernardis, Philippe Voarino, Franco Trespidi, Anthony Barbot,
Ioannis Tsanakas, Gianluca Timò, Mathieu Baudrit

Published in: AIP Conference Proceedings volume 1881, Issue 1881, 2017,
Page(s) 070003, ISBN 978-0-7354-1561-4

Publisher: AIP Publishing

DOI: 10.1063/1.5001436

[Innovative test facility for a comparative outdoor CPV modules characterization](#)

Author(s): Alessandro Minuto, Gianluca Timò

Published in: AIP Conference Proceedings volume 1881, Issue 1881, 2017,
Page(s) 020009, ISBN 978-0-7354-1561-4

Publisher: AIP Publishing

DOI: 10.1063/1.5001408

[Experimental characterization of achromatic doublet on glass \(ADG\) Fresnel lenses](#) 

Author(s): Guido Vallerotto, Marta Victoria, Stephen Askins, Ignacio Antón, Gabriel Sala

Published in: AIP Conference Proceedings volume 1881, Issue 1881, 2017, Page(s) 030010, ISBN 978-0-7354-1561-4

Publisher: AIP Publishing

DOI: 10.1063/1.5001421

Achromatic lens casting nearly uniform irradiance over MJ solar cells

Author(s): Marta Victoria, Guido Vallerotto, Stephen Askins, Ignacio Antón, Gabriel Sala

Published in: European PV Solar Energy Conference, 2017

Publisher: European PV Solar Energy Conference

[Fabrication of highly efficient four-junction solar cells by surface-activated wafer-bonding](#) 

Author(s): F. Predan, S. Heckelmann, M. Niemeyer, D. Lackner, A. Kovacs, R.E. Dunin-Borkowski, W. Jager, F. Dimroth

Published in: 2017 5th International Workshop on Low Temperature Bonding for 3D Integration (LTB-3D), 2017, Page(s) 37-37, ISBN 978-4-904743-03-4

Publisher: IEEE

DOI: 10.23919/LTB-3D.2017.7947433

[Shape characterization of the primary mirror of a mirror based solar concentrator](#) 

Author(s): Franco Trespidi, Emanuele Malvisi, Rolando Parmesani

Published in: AIP Conference Proceedings volume 1881, Issue 1881, 2017, Page(s) 030009, ISBN 978-0-7354-1561-4

Publisher: AIP Publishing

DOI: 10.1063/1.5001420

Other (4)

Progress in R&D on CPV cells and modules for highest efficiencies within the EU-funded project CPVMatch: Presentation held at CPV 2017, 13th International Conference on Concentrator Photovoltaic Systems, Ottawa, Canada, May 01 - 03, 2017

Author(s): Philipps, S.; Baudrit, M.; Grange, F.; Hillerich, K.; Parmesani, R.; Román, E.

Published in: AIP Conference Proceedings of the 13th International Conference on Concentrator Photovoltaics, Issue 1881, 2017

Publisher: AIP Publishing

Progress in R&D on CPV cells and modules for highest efficiencies within the EU-funded project CPVMatch - presentation at CPV-13 conference, Ottawa, Canada, May 1-3, 2017

Author(s): S.P. Philipps, M. Baudrit, F. Grange, K. Hillerich, R. Parmesani, E. Román, G. Sala, B. Schineller, G. Timò, A.W. Bett

Published in: 2017

Publisher: AIP

Modelling SMRs by means of standardized component cells spectral index Presentation only, at the CPV14 conference in Puertollano, Spain, 2018

Author(s): R. Núñez, I. Antón, R. Herrero, M. Victoria, C. Domínguez, S. Askins, N. Jost, L.J. San José and G. Sala

Published in: 2018

Publisher: AIP

High performance III-V multi-junction solar cells enabled by metamorphic growth and wafer bonding

Author(s): F. Dimroth

Published in: The 17th European Workshop on Metal-Organic Vapour Phase Epitaxy (EW-MOVPE 17), 2017

Publisher: INAC

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